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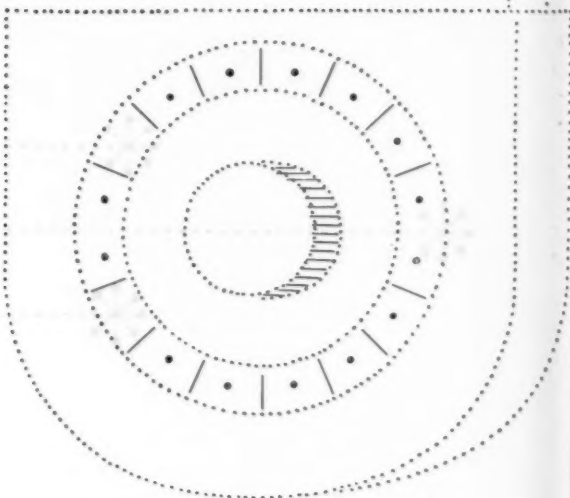
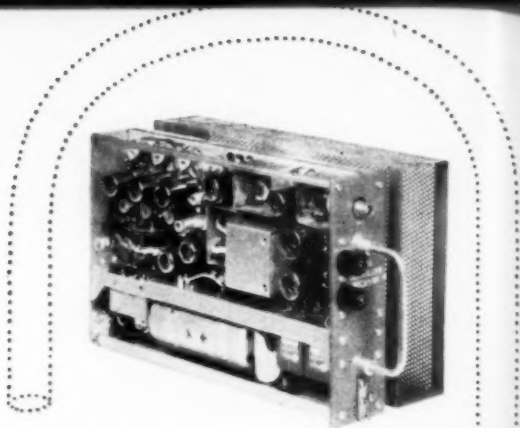
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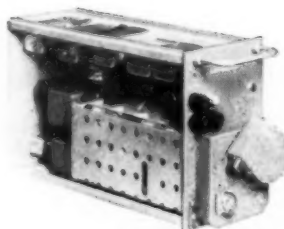
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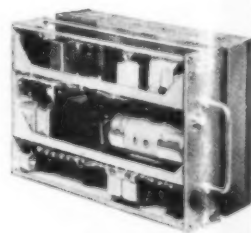
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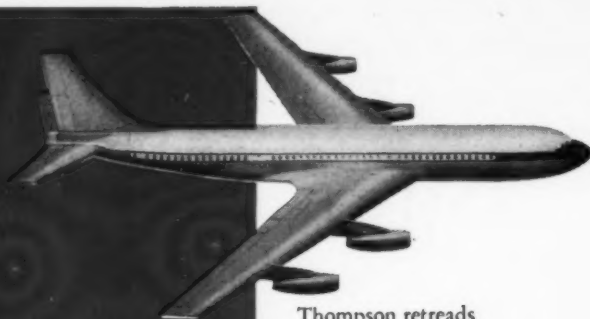
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Lowen on the Move

It is time to say a word about the new CAA Administrator, Charles J. Lowen.

The record indicates an extraordinarily good performance to date.

At the very best CAA is a rough job. But added to all of the headaches of running a controversial and often politics-ridden organization, Lowen's nomination was held up for months by a cantankerous Senate committee, he underwent an operation from which he is slowly recovering, and the Grand Canyon accident compounded the already staggering airways traffic control problem.

But Lowen is fast on his feet. One example of many is the mid-July request for an additional \$68 million for the expansion of the air traffic control system. Having pulled a five-year plan out from under the covers earlier, he is now trying hard to compress it into a three-year plan. At this writing Congress hasn't acted on the additional funds, but at least Lowen maneuvered the request through the maze of governmental corridors and offices until it was dispatched by the White House to Congress.

Among the noteworthy objectives to be attained with the extra funds is a progressive lowering of control of all airspace. Only recently the funds were made available to control the airspace above 24,000 feet. The Grand Canyon accident has hastened plans to lower this control to all airspace over 15,000 feet. If the extra funds are voted, the equipment can be purchased and personnel employed to reach this objective at a reasonably early date.

Lowen has applied a lot of common sense to his job. First of all he faced the need for healing the wounds existing between CAA and the Commerce Department. There is undoubtedly better liaison and more cooperation between CAA and Commerce than at any previous time, certainly more than during the past ten years. For once Commerce understands what CAA wants and

CAA realizes that it can get more of what it wants by letting Commerce help carry the ball upstairs and with Congress.

But the common sense has extended within CAA, too. There was little doubt that the rank and file of CAA personnel began bucking Lowen when he first arrived on the scene. He still is not getting the full cooperation he needs. But a good many in CAA are beginning to like the idea of getting things done in a businesslike and orderly fashion. They are even finding that advance planning can have its blessings.

All organizations must be judged on the abilities of their top men. So far Lowen has turned in a good record of picking good deputies. Men of the high caliber of Jim Pyle, Joe Tippetts and Dave Thomas do much to strengthen the organization. Given time and the freedom to pick strong, able men whose objectives are achievement and not petty empire-building, Lowen will have an all-round team worth its name.

On another front Lowen has demonstrated a forward-looking approach. He is obtaining a B-57 and several B-47s from USAF to test out the federal airways in advance of the coming commercial jet age. Initially this program was not too well received by all those concerned with noise at airports, but in actual fact the turbojet bombers will rarely, if ever, land on municipal airports, at least in the early stages. Lowen hopes to use the Boeing 707 transport prototype for airport testing after Boeing has perfected its noise suppression devices. The main thing is that Lowen is on the move with ideas and action.

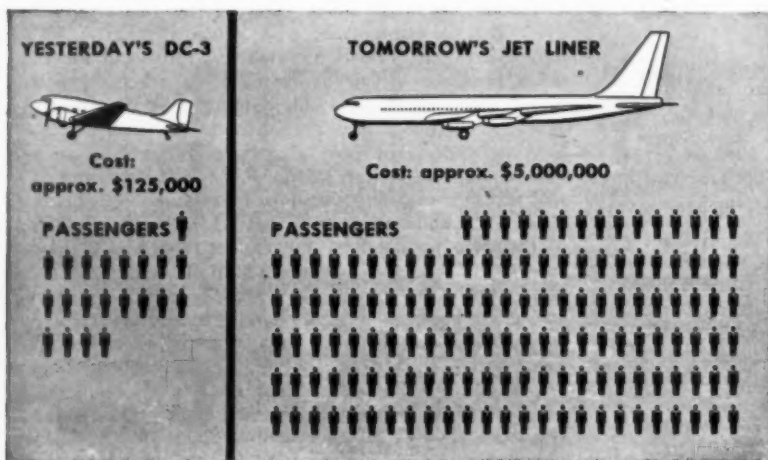
Industry people who have had dealings with Lowen find him easily approachable and amenable. He throws no curves, he is disarmingly frank, and amazingly receptive to new ideas.

CAA has had few kind words thrown its way in many years. It's a pleasure to report that Chuck Lowen is chalking up a commendable performance which, if continued, will set some sort of historic record.

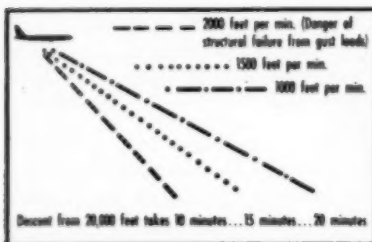
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When & Where

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- Aug. 1-5—Air Force Association annual convention, Roosevelt Hotel and Municipal Auditorium, New Orleans.
- Aug. 3-5—Experimental Aircraft Assn. 4th Annual Fly-In, Oshkosh, Wis.
- Aug. 7-9—ATA standard practices committee, Palace Hotel, San Francisco.
- Aug. 13-17—IAS National Turbine-powered Air Transportation Meeting, Grant Hotel, San Diego, Calif.
- Aug. 21-24—Western Electronics Show and Convention, sponsored by IRE and West Coast Electronic Mfrs. Assn., Pan-Pacific Auditorium, Los Angeles.
- Aug. 22-24—Bendix Scintilla Int'l Ignition conference, Sidney, N. Y.

SEPTEMBER

- Sept. 1-3—1956 National Aircraft Show, Will Rogers Field, Oklahoma City.
- Sept. 3-9—Society of British Aircraft Constructors exhibition and flying display, Farnborough, England.
- Sept. 6—Sixth annual Airwork-Pratt & Whitney Aircraft engine operation and maintenance forum, Millville, N. J.
- Sept. 9-11—International Northwest Aviation Council convention, Boise, Ida.
- Sept. 10—Pratt & Whitney-Southwest Air-motive Co. engine forum, Melrose Hotel, Dallas.
- Sept. 13—Airwork-Pratt & Whitney Aircraft engine operation and maintenance forum, Miami, Fla.
- Sept. 14-15—Conference on Communications, Roosevelt Hotel, Cedar Rapids, Iowa.
- Sept. 17-21—Annual general meeting International Air Transport Assn., Edinburgh, Scotland.
- Sept. 18—Third Air Navigation Conference, Montreal.
- Sept. 24-26—American Rocket Society fall meeting, Hotel Statler, Buffalo, N. Y.
- Sept. 25-29—International Association of Aircraft Constructors jet transport conference, The Hague.

OCTOBER

- Oct. 1-3—National Association of State Aviation Officials annual meeting, Lake Placid, N. Y.
- Oct. 1-3—National electronics conference and exhibition sponsored by AIRE, IRE, Illinois Institute of Technology, Northwestern University and University of Illinois, Hotel Sherman, Chicago.
- Oct. 2-4—1956 Aircraft Spark Plug and Ignition Conference, sponsored by Champion Spark Plug Co., Secor Hotel, Toledo, Ohio.
- Oct. 2-6—SAE National Aeronautical Meeting, Aircraft Production Forum and Engineering Display, Hotel Statler, Los Angeles.
- Oct. 3-5—Seventh annual National Airports Conference, University of Oklahoma, Norman, Okla.
- Oct. 7-9—American Helicopter Society western forum, Adolphus Hotel, Dallas.
- Oct. 8-10—Second annual symposium on aeronautical communications sponsored by IRE, Hotel Utica, Utica, N.Y.
- Oct. 10-12—SAE National Transportation Meeting, Hotel New Yorker, New York.
- Oct. 13-20—Eighth Annual All-Texas Air Tour, headquarters Walton Bldg., Austin, Tex.
- Oct. 23-25—National Business Aircraft Association 9th annual meeting and forum, Miami, Fla.
- Oct. 25-26—Aircraft Electrical Society annual display of electrical equipment, Pan-Pacific Auditorium, Los Angeles.
- Oct. 29-30—Third annual East Coast Conference on Aeronautical and Navigational Electronics, sponsored by IRE, 5th Regiment Armory, Baltimore.

NOVEMBER

- Nov. 1-3—National Aviation Trades Association annual convention, St. Louis.
- Nov. 8-9—SAE national fuels and lubricants meeting, Mayo Hotel, Tulsa, Okla.
- Nov. 14-15—Aircraft Industries Association export conference, Miami Beach, Fla.

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JULY 30, 1956

Industry News Digest

Capital Orders 14 Comets; May Become First U.S. Airline to Fly Jets

In a bid to become the first U.S. airline to operate jet transports, Capital Airlines has ordered 14 De Havilland Comets. The contract, worth \$53 million, puts the British company back as a major competitor for the U.S. aircraft industry in the jet transport sweepstakes.

Capital is due to receive its first Comet in the last half of 1958, with scheduled service to start in early 1959. Hitherto it looked as if American Airlines would be the first U.S. domestic airline to begin jet service. It had set June 15, 1959 as the starting date.

Four of Capital's Comets will be Model 4s while the other ten will be Model 4As. The Comet 4A differs from the Model 4 in having a fuselage 40 in. longer, enabling more than 70 passengers to be carried in a first-class, two-abreast configuration, and up to 92 in tourist-class seating.

The Model 4A has a wing span of 108 ft. (against the Model 4's 115 ft.) and this, coupled with some structural reinforcement of the rear fuselage and tail, enables a higher cruising speed (up to 545 mph) to be obtained at lower altitudes. Consequently, this version is particularly suitable for short and medium-stage routes. Both the Comet 4 and the 4A gross 152,000 lbs. and are powered by four 10,500-lb. Rolls Royce Avons. The latter is faster but requires slightly longer runs for takeoff and landing than the Model 4.

• **What will happen** on U.S. certification of the Comet remains to be seen. De Havilland made formal application to CAA in June for such certification. Two CAA officials from Washington will join a European-based CAA engineer in England on August 20 for

a preliminary board meeting. This group will report to Washington and subsequently the British Air Registration Board will be informed what special conditions must be met before the U.S. will recognize the British certificate of airworthiness.

CAA may be expected to be open-minded on the key issue regarding certification of the Comet—the location of the engines in the wing rather than in external pods as fitted to U.S. jet transports.

A few years ago CAA was definitely opposed to "buried engines" but lately seems to have modified its views. One factor that will be important in helping CAA make up its mind will be the record of the Comet 4's powerplant—the Rolls Royce Avon. The Comet 1 and 1A had DH Ghosts.

The Capital order for Comet 4s and 4As supplements BOAC's order for 19 Comet 4s. A development of

Military Obligations for 1956 Reach \$5.9 Billion

Military obligations for planes, missiles, drones, components and related equipment totaled \$5,919,000,000 in the first 11 months of fiscal 1956. Total for May was \$594 million.

USAF's May contract awards totaled \$446 million and Navy procurement was \$148 million. The 11-month totals were \$4,380,000,000 for USAF, \$1,539,000,000 for Navy.

On the spending side, May totals were \$489 million for USAF and \$181 million for Navy, resulting in 11-month figures of \$5,370,000,000 and \$1,640,000,000, respectively. On May 31, USAF's unobligated balance was \$6,199,000,000, and Navy's was \$2,749,000,000.

the Comet 1 and 1A, which accumulated 30,000 hours of operation in two years of airline service, the Comet 4 and 4A are likely to find customers among the several airlines which ordered the Comet 2, a model that was abandoned for the commercial market.

Today's Aircraft 'Many Times' Costlier Than Those of Last War, Study Shows

Actual price of today's jet fighters and bombers has increased "many times" over World War II models, and future planes will cost even more, according to a cost analysis by Aircraft Industries Association.

However, improvements in management organization, utilization of labor, and employment of latest production methods and equipment have made it possible for plane makers to produce more airframe pounds per manhour than during the war years, AIA added.

Contributing to cost growth are inflation in cost of personnel, material

and equipment, larger planes and increased complexity. Despite these pressures, the analysis said, in at least one recent case the industry turned out a medium bomber which cost less per pound of airframe weight than a World War II heavy bomber, after allowing for inflation.

• **Average hourly wage** in the aircraft industry jumped from \$1.22 in 1944 to \$2.17 in 1955, and cost of materials also rose substantially. And AIA gave the following examples of the effect on costs of demands for constantly increasing performance:

Model of Comet 4 in Capital Airlines Markings.



• **Engineering:** One company devoted 123,014 engineering manhours to a World War II piston fighter prototype, 492,880 hours to a jet fighter now in inventory, and expects to give 2,144,360 hours to the prototype of its next production aircraft. Another company reported 238 hours of wind tunnel tests for a WW II bomber against 8,000 hours for a heavy bomber now in production.

• **Labor:** More highly skilled personnel are now required. One plant employs 62 highly-skilled categories of workers today, against 23 in the last war.

• **Materials:** To meet heat problems produced by high-speed flight, manufacturers have turned to new metals like titanium, which average \$20

a pound in fabricated form, compared with \$1 for aluminum.

• **Tooling and Equipment:** Costs have increased 300% to 400% over and above effects of inflation. A \$30,000 spar mill of WW II is now quoted at \$190,000. Rivet squeezers formerly costing \$500 to \$1,000 are being replaced by \$80,000 automatic models.

• **Construction:** A Mach 3 wind-tunnel costs \$15 million, against \$150,000 for a Mach .05 tunnel in WW II.

• **Testing and Evaluation:** This cost element has increased to a greater degree than any other single factor. A WW II flight test program could be completed with three planes and 250 flights. Present programs require two to three times as many planes and more than 1,000 flights.

Hebert Blasts Renegotiation Act As Unfair and Inequitable

Asserting that there is nothing "fair" or "equitable" about operations of the Renegotiation Act, Rep. F. Edward Hebert (D-La.) has urged that the Renegotiation Board have rules "that are known and rules that anybody can see and anyone can follow."

Hebert, whose Armed Services Investigations Subcommittee gave the airframe industry a clean bill of health (see page 21) and found that profits have not been excessive, blasted renegotiation in a supplementary statement to the group's report.

"We are told that renegotiation isn't an exact science," he said. "Well, if it isn't an exact science, it takes away an exact amount of money depending on its own whims, and I don't think that is either good administration or good judgment."

He called renegotiation a "hydra-headed monster which everyone seems to be afraid to disown for fear he will be charged with wanting to pay excessive profits." Urging rules for the Board, he added: "Let's have everyone see how its business is done . . ."

• **Hebert said** he was "stunned" at salaries that some airframe companies pay their executives. "Why, the President of the United States and his Cabinet and the White House staff don't have an executive payroll the size of a few of these smaller companies. . . . It puts the whole of the industry in an unfavorable light because it suggests that other expenses of doing this work are being overloaded in proportion."

He added that he feels "very much more confident for my country's safety because of the time we spent" in airframe plants. "I am very well satisfied with the production facilities which I saw and I am reassured after talking directly to the men who put out these planes."

The industry shouldn't have to be "temporary treasury depositories for money which belongs to the Treasury itself," he said. The subcommittee's financial questionnaire, he added, showed USAF contractors had over \$200 million in refunds waiting to be cleared, and Navy contractors over \$150 million for return. Before hearings began, the amounts had been reduced to less than 10% of that."

Helio Aircraft Acquires Mid-States Mfg., Co.

Helio Aircraft Corp., Norwood, Mass., bought the plant and organization of Mid-States Manufacturing Co., Pittsburg, Kan., and says it has become the fifth largest manufacturer of business and private planes in the U.S. Transaction involved about \$1 million, almost half in Helio common stock, the remainder in notes.

Main product of the companies will continue to be the Helio Courier, STOL (short takeoff and landing) aircraft.

Mid-States has been fabricating the plane during the past year for Helio as an independent contract manufacturer. It will also continue to produce aircraft components for airframe manufacturers, and Helio's Norwood plant will remain in the electronics components business.

Airline Group to Study Anti-Collision Devices

A scheduled airline committee will soon evaluate proposals for an interim anti-collision device.

The Air Transport Association group, headed by American Airlines vice president William Littlewood, was named just one day before the TWA-United Grand Canyon accident to start talks with electronics companies regarding development and production of an airborne proximity warning indicator (see page 67).

The group is said to feel that an "ultimate and complete" collision warning device might take two or three years to develop and produce. However, an interim device which could do about 90% of the desired job and furnish operational experience for the ultimate product might be made available in a matter of months, it believes.

Scheduled Airlines Win Court Victory

The scheduled airline industry won a major court victory this month in its challenge of a Civil Aeronautics Board decision awarding enlarged operating rights to non-scheduled airlines. In a unanimous July 19 opinion, the U.S. Court of Appeals, District of Columbia Circuit, remanded the decision to CAB for "further proceedings."

Court held that CAB failed to make findings to support its decision to give near-certificate authority to non-skeds on an exemption basis.

Effect of the Court ruling will be to "set aside," as of August 4, CAB's

(Continued on Page 14)

First USAF Jet Tanker Rolls Out

Boeing has rolled out the first of a large quantity of Air Force KC-135 four-jet tankers at its Renton plant, 21 months and 13 days after the production order. In background is the 888th and last KC-97 tanker, which was rolled out concurrently. KC-135 will be flown in September, delivered to AF in October.



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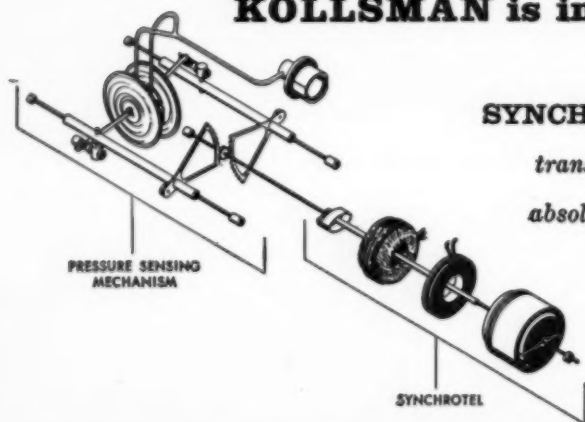
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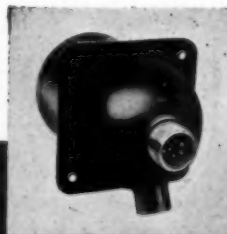
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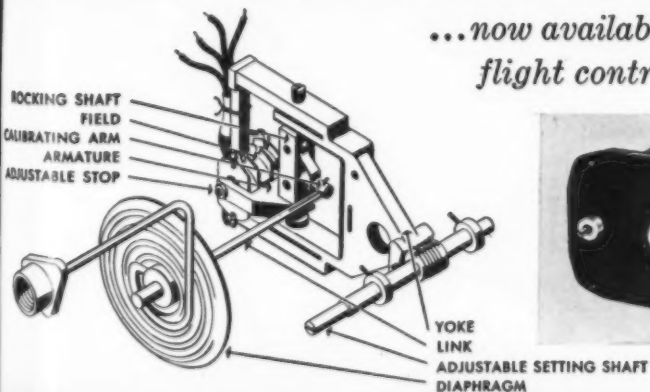
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Industry News Digest

(Continued From Page 11)

decision of November 15, 1955, and thus terminate the right of non-skeds to (1) operate as Supplemental Air Carriers and (2) advertise and operate regular schedules up to 10 flights per month between any two points. Rules in effect prior to the controversial Board decision would then re-apply.

• **Future litigation**, however, could delay the effective date of the Court order. CAB or the non-skeds could get an automatic stay by petitioning the Court for rehearing (a normal but usually fruitless venture). Or they could petition for a stay pending a possible appeal to the Supreme Court.

BEA Aircraft Order Totals \$56 Million

British European Airways signed a \$56 million contract with Vickers-Armstrongs covering 20 Vanguards and 16 more Viscount 800s.

The Vanguard, a large turboprop transport that will carry up to 115 passengers, will be powered by four Rolls-Royce Tyne engines. As delivered, the engine will produce 4,470 chp, but will increase to 5,500 chp by 1960. The first Vanguard is expected to fly in the fall of 1958 and will be delivered to BEA in the spring of 1960.

CAB Official Hits Overbooking Practices

CAB's Compliance Chief James Anton has instructed the certificated airline industry to amend practices connected with oversales which he termed to be in violation of various sections of the Civil Aeronautics Act.

In a letter to all airline presidents, Anton hit specifically at "deliberate overbooking of flights to offset the expected number of no-shows" and the "granting of free transportation or cash payments to oversold passengers."

News Briefs

MANUFACTURING—MILITARY

• The plant where Convair will build the Atlas intercontinental ballistic missile will be named Convair-Astronautics. The \$40-million project is to be completed in 1957. Convair and USAF will each pay about half the cost.

• USAF's Wright Air Development center has a new altimeter, developed for it by Kollsman Instrument Corp., which is 400% more accurate below 50,000 ft. and 100% more accurate above that altitude than present instruments.

Rearward-Facing Seats Helped Save Lives

Some USAF officers feel that rearward-facing seats in the Military Air Transport Service's C-118 Liftmaster that crashed July 13 after takeoff from McGuire AFB, N. J., were instrumental in saving the lives of those who survived.

Of 56 passengers and 10 crew members, 45 were killed. The plane was enroute to England. Col. John Williams, commanding officer of the 1611th Air Transport Group, to which the plane belonged, said the rear-facing seats were a "major factor in saving the lives of those who did survive."

The altimeter will permit USAF to cut vertical distance between planes in flight from 2,000 to 1,000 ft.

• The Boeing 707 jet transport landed at Los Angeles International Airport, marking the first time it has landed at a civil airport other than its home base at Boeing Field, Seattle. Only previous landings away from Seattle were at Andrews AFB, Md., and Offutt AFB, Omaha. Seattle-Los Angeles flight took 1 hr. 57 mins.

• Air Materiel Command, Dayton, asked for proposals from prospective contractors for operation of Army's pilot training school at Edward Gary air base, San Marcos, Tex. This marks the first step in switching the school from a military operation to a contract-operated school. Tentative cutoff date for proposals is first week in September.

NAA's New Navy Basic Trainer



North American Aviation has received a Navy contract to design and develop through mockup a new tandem seat basic trainer to be designated T2J. Aircraft will be powered by a 3,400-lbs.-thrust Westinghouse J34. Top speed will be more than 400 knots, service ceiling 40,000 ft. Trainer can be operated from carriers. Work on trainer is under way at NAA's Columbus, Ohio, Division.

• Douglas Aircraft Co.'s sales were up but earnings dipped during the first half of its fiscal 1956. Sales for six months ended May 31 were \$453,076,740 against \$435,840,620 in same 1955 period. Earnings were down from \$13,680,622 to \$12,820,637, due to heavy development writeoffs, most of which are applied to the DC-8.

TRANSPORT

• Public hearing into the cause of the United-TWA collision over Grand Canyon on June 30 will be held in the Commerce Dept. auditorium, Washington, D.C., beginning Aug. 1.

• President Eisenhower signed a bill authorizing permanent certification of airlines operating within Alaska and Hawaii.

• American Airlines for the first time named a vice president to head its cargo operations. Samuel C. Dunlap, one of the founders of Slick Airways, of which he was formerly executive v.p. and a director, is the new v.p.-cargo (mail, express and freight).

• Southwest Airways asked CAB for permission to change its name to Pacific Air Lines Inc., effective Jan. 1, 1957. SWA said the new name is "more descriptive of the Pacific seaboard route system now being operated."

• American Airlines' net earnings for 1956 first half were \$9,739,000 exclusive of profit on sale of aircraft. Total earnings including plane profits were \$10,671,000, compared with \$8,537,000 for same 1955 period. Revenues in 1956 were \$140,139,000 against \$124,869,000 last year.



Washington Report

Questions on Pacific Reshuffle

Pentagon's plan to consolidate Far East Command under Adm. Felix Stump's Pacific Command raises important questions concerning assignments of Gen. Laurence Kuter, CO of Far East Air Forces and other top USAF generals in the Pacific.

It is expected FEAF will be abolished as a separate entity and its headquarters attached to Stump's command. If this course is taken, it is not clear whether Kuter would remain in charge of AF elements in the Pacific, even though no major changes in deployment of forces takes place.

Another question is the status of Maj. Gen. Sory Smith, chief of Pacific Air Command at Honolulu. The former Pentagon AF information chief also is deputy CO of FEAF. There is some speculation Pacific Air Command will be abolished, with Smith staying on as deputy commander of the new organization that will replace FEAF.

Realignment of Pacific and other commands has been attacked as the entering wedge for subsequent sharp reductions in U.S. forces abroad, despite Pentagon denials. Defense Department insists reshuffling merely is designed to eliminate excess military headquarters operations and to streamline present unwieldy split-command setup.

No Air Show Bid to Reds

Russia's top air force officials will not be invited to attend the 1956 National Aircraft Show at Oklahoma City Sept. 1-3. Decision was made by the White House.

This, however, does not rule out a future visit by the Russians in return for USAF Chief of Staff Gen. Nathan F. Twining's invitation to the Red air show in Moscow last month.

Military air attachés from Washington, including those from Iron Curtain countries, are expected to attend the Oklahoma show, which is a private affair sponsored by the Air Foundation and the Oklahoma City Chamber of Commerce.

ACC: How Much Influence on CAB?

Civil Aeronautics Board participation in activities of the Air Coordinating Committee has been challenged by members of the Mollohan House Government Operations subcommittee.

Chairman George Mollohan and Rep. George Meader contend that through CAB participation in ACC, military and other administrative agencies are indirectly taking part in Board activities. This, they point out, is against Congress' intent when it established the quasi-judicial, quasi-legislative Board. They argue that if CAB votes in any ACC matter, it is automatically bound to follow the ACC recommendation, thus directly influencing CAB powers of decision and rule-making.

This position actually was strengthened by Board officials' testimony. Vice Chairman Joseph Adams de-

clared that the Members would have to stand behind a vote made by a CAB representative on the ACC; and Franklin Stone, Board general counsel, added that CAB would be "morally, but not legally, bound" to carry out recommendations for which its representative on ACC had voted.

However, Board Chairman James Durfee defended CAB participation. "We can't operate in a vacuum in promulgating rules." He added that he didn't think ACC recommendations would in any way affect CAB decisions.

Where Are Those Big Red Presses?

One thing that struck Gen. Nathan F. Twining as significant during his recent visit to a Moscow airframe plant was the absence of forgings and extrusions in the manufacture of wing and fuselage sections, landing gear and the like.

The USAF chief saw Russians building up wing and fuselage sections for Il-14 transports by riveting together masses of smaller parts and building landing gear from welded sections. This is in sharp contrast to U.S. practice of employing growing quantities of forgings and extrusions for this type work, with a consequent increase in manhour productivity.

Although the plant visited was an old one and the Il-14 is not a highly advanced combat machine, it is difficult to understand why extrusions and forgings, even of a modest size, have not made an appearance in the Soviet airframe manufacturing process if such items are available.

In this connection, it is interesting to recall the AF sales campaign several years ago in support of its program for large hydraulic forging and extrusion presses. At that time, AF warned that Russia was making big strides in heavy press technology, that U.S. was in grave danger of falling behind. That possibility may be regarded as remote if techniques of the Moscow plant are typical of the Red aircraft industry.

Mid-Air Collision Record

There were 127 mid-air collisions in the years 1948 through 1955, all of which occurred under VFR (visual) conditions. Of these, 93 occurred below 1,500 feet.

CAA told the Mollohan subcommittee that most of the accidents occurred between private aircraft. Here's the breakdown:

Air carrier to air carrier, 2; air carrier to private aircraft, 11; air carrier to military, 2; private aircraft to private aircraft, 96; private aircraft to military, 16. Sixty crashes resulted in fatalities.

Cost Factors Changing

While cost of producing modern aircraft has risen steadily since World War II, cost of manpower and overhead in relation to the whole aircraft has dropped sharply, despite nearly doubled hourly wage rates. (See story page 11).

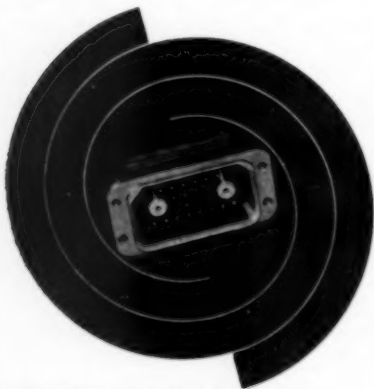
Aircraft Industries Assn. reports labor and overhead represent only 26.8% of the cost of a modern jet fighter, compared with 45.7% of a World War II fighter. Material and equipment, on the other hand, has jumped from 17.8% to 26.9%. Government furnished equipment, including engines and electronics, has risen from 36.5% of a complete WW II aircraft to 46.3% of a modern jet fighter.

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Production Spotlight

• Fact that Lockheed's flight test department assigns two chase planes to F-104A test flight at Edwards AFB indicates the supersonic fighter has more range than generally believed. One chase plane runs out of fuel before the F-104A flight is over.

• Reports of U.S. observers on large size of radars at Russian airfields could indicate the USSR is using the lower practical radar frequencies—in the order of 100-500 mc. Very large antenna reflectors would be needed at lower frequencies to achieve good target resolution. Use of these frequencies could indicate slower progress in microwave tube art than in U.S. Rotating antenna atop Moscow airport terminal is older stacked-dipole array.

• Bell Aircraft's reconnaissance and search bomber (AMERICAN AVIATION, Apr. 11, 1955), under development with North American Aviation for ARDC, has been designated XRB-118A. Program may go to Phase II in September, with companies receiving an order for a prototype.

• McDonnell's F-101B may be the last of the strategic fighters. Strategic Air Command sources say a bomber defense system using missiles to neutralize hostile missiles and aircraft is most urgent requirement of SAC.

• Bell auxiliary rocket motors for Convair B-58 apparently will use nitric acid as oxidizer. Convair has started classes at Ft. Worth in handling of the acid.

• Avro's Super Vulcan bomber project has been dropped by the British in favor of a supersonic reconnaissance bomber.

• Handley Page is building a Super Victor bomber to be powered by Rolls-Royce Conway by-pass jets.

• Bristol Aircraft's mathematical services group recently installed a \$140,000 English Electric Deuce digital computer to solve missile and supersonic aircraft problems.

• Prospects of Blackburn & General getting orders for British license versions of French Turbomeca aircraft turbines are deteriorating. RAF still has not made up its mind what type jet trainer it will order, but the Turbomeca-powered Miles M-100 is definitely out.

• Germany's Dornier Do-27 is attracting attention of the French Army. If an order is placed, Fouga probably would build it under license.

• Production prospects for Spain's Casa 207 Azor twin-engine transport are brightening. Germany's Blohm & Voss company is interested in building the aircraft with Napier Eland turboprops instead of present Bristol Hercules piston engines.

• Argentina's aircraft plant at Cordoba now is called by its original name, Fabrica Militar de Aviones. The Peron regime had renamed it IAME.

• SNCA du Nord and its German licensee, Flugzeugbau Nord, are discussing a development of the Noratlas transport using Napier Eland or RR Dart turboprops.

• First production batch of 50 Morane-Saulnier Paris jet personal planes will be delivered by the end of 1957. French navy and air force will use them for liaison and training.

• DeHavilland has revived the Comet 5 project, is offering it to British Overseas Airways Corp. through Ministry of Supply as a New York-London nonstop jet transport.

Letters

For the Record

To the Editor:

We would like to point out an error of omission in your article "Auto Makers Move Into Missile Business," on page 29 of your July 2 issue.

The article states "Today the only automobile company still actively producing a complete airframe or engine is Ford's Aircraft Engine Division at Chicago." In the next paragraph it was also stated "... the ... automotive manufacturers have never shown much interest in designing airframes and engines of their own."

Obviously, this overlooks the fact that Allison, as a division of General Motors, not only is continuing to produce complete engines but has had a very active engine development program.

The T56 (Model 501) turboprop and J71 represent our most recent engine developments. In addition, as we have announced, we are going forward with other important engine development programs.

We are pointing this out to clarify the record insofar as the Allison Division of General Motors is concerned.

ROGER C. FLEMING
Director of Public Relations
Allison Division
General Motors Corp.
Indianapolis, Ind.

He Likes Us But . . .

To the Editor:

I should like to take this chance of congratulating you on your excellent WWP series of articles on Soviet Russia.

Now a little criticism. I am most hurt to find that during my subscription, the Comet jet airliner has been mentioned very little. The Comet III's recent world tour, including the first nonstop Atlantic crossing by a jet airliner, certainly deserved more than a small column at the foot of one of the middle pages (AMERICAN AVIATION Jan. 16).

Not even a photo. Is it that the U.S. is scared of too much publicity in case PAA should decide to order the Comet 4?

Every week, I buy my copies of Flight and Aeroplane (amongst others) and I find that they give credit where credit is due.

However, in the long run, I haven't really much to complain about. AMERICAN AVIATION is still the best aircraft magazine in the world! Thanks a lot and keep up the good work.

JOHN CLARKE MOORE
Johannesburg, S. Africa

'Maxsonites' Thrilled

To the Editor:

The photo captioned "Pair of Marine Terrier Missiles" on page 31 of the July 2 issue of AMERICAN AVIATION was a thrilling one to many Maxsonites. Reason? The Mobile Launcher, MK3 Mod O, was designed, developed and built by the W. L. Maxson Corporation. We hope that you can include this information in any future references to this launcher.

S. H. GOLDSTEIN
W. L. Maxson Corp.

New York, N. Y.

JULY 30, 1956

Compliments

To the Editor:

Bill and Dorthie Anne Horton were delighted at the coverage given their custom works (AMERICAN AVIATION, June 18), and have received numerous comments around the airfield. Congratulations again on such a fine magazine.

ROBERT MCGUIRK
Bevel & Associates
Ft. Worth, Tex.

To the Editor:

I hasten to send my heartiest congratulations on the wonderful article you wrote in connection with our F-27 purchase (AMERICAN AVIATION, July 2). It was one of the most understandable presentations of a rather complicated subject that I have ever seen.

T. H. DAVIS
President
Piedmont Airlines
Winston-Salem, N. C.

To the Editor:

Just received the June 18 issue of AMERICAN AVIATION. Many thanks for a "constructive and well-tempered" piece on the problems of these here small businesses of ours.

JOHN MARSCHALK
Executive Director
Small Defense Industries Assn.
Los Angeles

To the Editor:

Your hard-hitting factual report of the (Eastern Air Lines) Miami staff meeting in the July 2 issue of your

magazine was very well done. Congratulations.

ANDREW G. DIDDEL
New York sales manager
Eastern Air Lines

Those KB-50 Tankers

To the Editor:

In your July 16 issue, page 29, you show a picture of the KB-50 tanker. In the news item under the picture, you label this as the "Boeing tanker."



This conversion of an obsolete bomber to an aerial tanker for the Tactical Air Command was made by Hayes Aircraft Corp., Birmingham, Ala.

It was engineered, prototyped, and now is in full production by this company.

In fairness to all concerned, I would certainly appreciate it if this picture could be re-run with credit given to the Hayes Aircraft Corp. for this conversion.

LEWIS F. JEFFERS
President,
Hayes Aircraft Corp.
Birmingham, Ala.

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USAF'S MOST URGENT REQUIREMENTS: For SAC, a bomber defense system utilizing missiles to neutralize enemy missiles and aircraft. For Air Defense Command, a light, reliable fire control system capable of positive radar identification of targets at ranges up to 100 miles. If latter system can be developed, reports are that USAF may order a new long-range interceptor (LRI) competition.

PROSPECTS OF USAF ORDERS for a quantity of primary jet trainers appear brighter. Recent interest has been shown in Temco Model 51 and Beech Model 73. USAF has no provision for small jet trainers in present programs, except for twin-jet Cessna T-37. It may try to squeeze others in if evaluations are favorable. Navy has already gone in for primary jet trainers, with an order for 14 Temco TT-1s (Model 51), plus a contract with North American for development of a more powerful model (T2J). Military may eventually go into all-jet training for student pilots—primary, basic and advanced.

U.S. ARMY WANTS TO ACQUIRE several Twin Pioneers from Scottish Aviation if it can get deliveries. No large production order for the short-field transport is likely, however. The Scottish firm is flooded with orders but is having trouble getting full-scale production under way.

DRASTIC MILITARY MANPOWER CUT under preparation in the Pentagon spells bad news for aviation, no matter how the reductions fall on the three services. Adm. Arthur Radford, JCS chairman, reportedly wants to cut 450,000 from the Army by 1960, plus 200,000 from Navy and 150,000 from USAF. *Heaviest cuts* are focused on the more "traditional" areas of the defense establishment. But it is in just those areas that aviation may suffer the most. For example, by wiping out half of the Army's divisions and a good number of its proposed 48 helicopter companies, Radford's plan would cut sharply a large and growing market for aviation products. *Conclusion to be drawn* from this is that aviation is no longer immune to cuts in what were heretofore non-aviation parts of the defense set-up. Today there is hardly a significant part of the nation's military force that doesn't use or plan to use aircraft.

RESEARCH AND DEVELOPMENT PLANNERS in USAF are giving increased attention to problem of finding materials that can withstand heat generated by planes flying at Mach 2 or more. There's a growing tendency to regard materials technology as the key—or chief obstacle—to further substantial advances in aircraft performance. USAF isn't looking for small improvements, either. "What we need are major break-throughs all along the line," says Lt. Gen. Thomas Power, ARDC commander.

DOUGLAS AIRCRAFT HAS ABANDONED the British tilting wing design for the 40-passenger short takeoff airplane which it had lined up as a future project. It's now working on a simple high-lift wing to achieve an 800-ft. takeoff and landing.

USAF WILL COME OUT with the "big" ICBM story at Air Force Association convention Aug. 2 in New Orleans. Earlier plans had been to spill it at Aviation Writers Association convention in San Francisco. But USAF decided AFA would give it a bigger push.



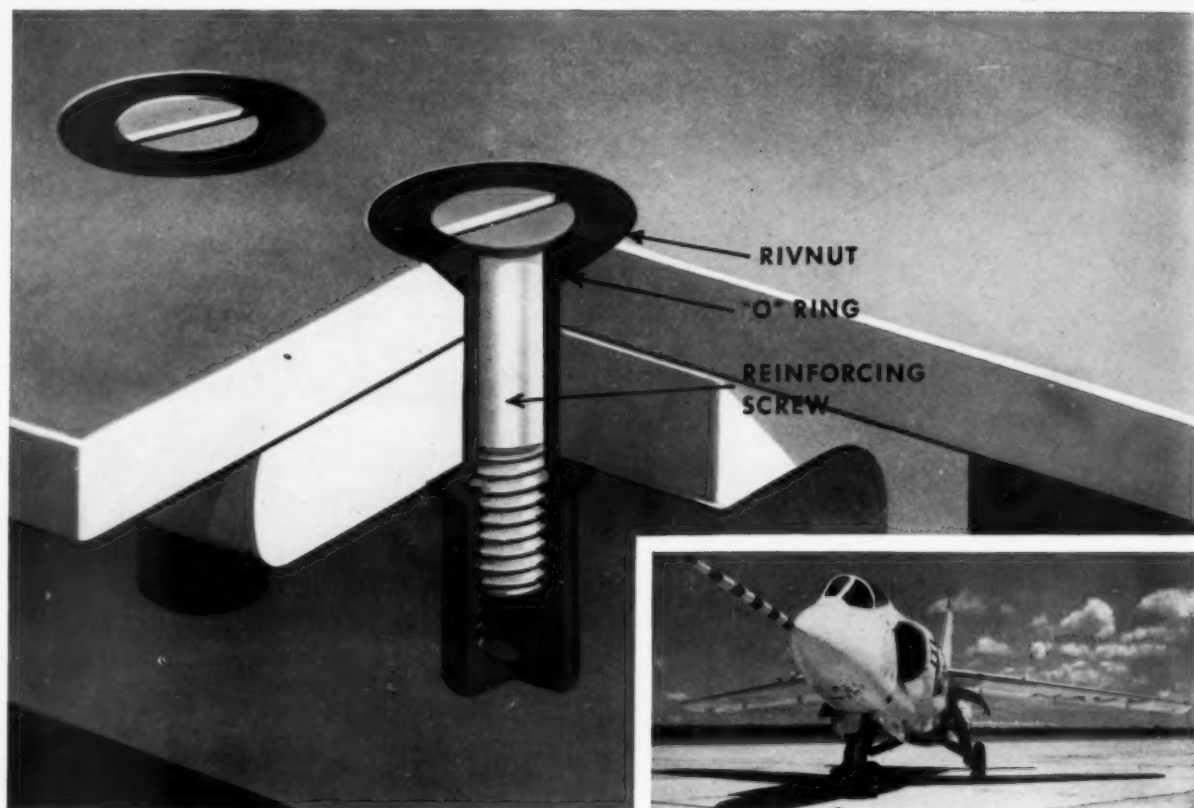
YOUR WELFARE IS BEING OVERSHADOWED

Our freedom is increasingly dependent upon scientists and engineers, but we are being overshadowed! Since 1950, our need for technically trained personnel has continued to increase, while the enrollment of new engineering students has declined sharply. This critical shortage threatens our future security! For America to maintain its national and industrial leadership, now and in the years ahead, more of our talented and creative youth must be encouraged to pursue careers in science and engineering. These fields offer them unprecedented advantages, and at the same time an opportunity to serve their country!

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B.F. Goodrich



New Seal-Head Rivnut simplifies integral wing tank assembly

GRUMMAN ENGINEERS wanted to use integral wing tanks to stretch the range of their F11F-1 Tiger. Fuel tank walls would be the single top and bottom aluminum skin panels that form each wing. The problem was to find a blind fastener that could join the wing sections tightly enough to withstand the strains of supersonic flight and still prevent loss of fuel.

Working with Grumman, B. F. Goodrich engineers solved the problem by developing a Seal-Head Rivnut with rubber "O" ring, approved for primary structure. The cross section above shows how it works.

The new B. F. Goodrich Seal-Head

Rivnut is a precision-ground steel fastener with high tensile strength. Installed in a drilled and countersunk hole, the Rivnut actually rivets the sections together. The "O" ring makes a fuel-tight seal and withstands temperatures from -65° to 225° . Then a special screw, available in tensile strengths up to 165,000 p.s.i., is screwed into the Rivnut to further reinforce and secure it against strain and vibration.

Whatever your fastening problem, there's probably a B. F. Goodrich Rivnut that can solve it. For more information, write: *Aeronautical Sales, B. F. Goodrich Tire and Equipment Company, a Division of The B. F. Goodrich Company, Akron, Ohio.*

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AMERICAN AVIATION

Why 'Excess Profits' Investigation Fizzled

House Armed Services Subcommittee found airframe builders are doing outstanding job under difficult conditions.

By FRANCIS J. KEENAN

HOUSE Armed Services Investigations Subcommittee last week gave a clean bill of health to the airframe industry.

The subcommittee's assertion that "the Government is getting substantial Value" from its investment in and contractual relationships with the industry contrasted strikingly with the hostile statements about "excess profits" which launched the comprehensive inquiry.

The fact, too, that all subcommittee members—including several who expressed strong criticism of the industry during open hearings—approved the report, testifies to the persuasive case presented by airframe manufacturers.

Highlights of the report follow:

- Profits of the airframe industry are "perhaps better expressed . . . to a large extent in terms and in the sense of a 'management fee,'" rather than as return on earnings, invested capital, net worth, or net sales.

- Comparison of airframe industry profits with those of other industries "is simply not applicable," since the airframe industry strongly contrasts with others in (a) heavy Government investment in the facilities producing industry income, and (b) the greater amount of risk capital used in other industries.

- "Government interests would be better served if it abandoned rental charges" on its industry-operated plants "and took its return in reduced costs of the airframes produced. Such a plan would transfer to the using companies the maintenance account. The addition of rental only serves to inflate operating expenses and the return to management on operating costs."

- On facilities used by companies engaged in commercial work, "a rental should be charged for whatever portion is privately used."

- Rather than liquidating Government-owned plants, they "are better kept 'in being,' with some provision for maintenance, and utilized in the production program for the foreseeable future."

- Reluctance of airframe manufacturers to buy Government plants is understandable. The 12 companies covered in the study plan expenditures of about \$350 million for new facilities in next few years, thereby bringing their total investment to \$744 million as opposed to Government investment of \$895 million. Acquiring the Government inventory "would not add to their total production capabilities, but at the same time it would add a maintenance burden and a capital risk."

- "There is a limit to the profit which any of these companies can retain in business;" their records on distribution of profits in dividends "is conservative;" and, "without legal compulsion, these companies have a creditable record of plowing back into their plants between 60 and 70 percent of net earnings after taxes."

- The subcommittee "is in full ac-

cord" with the principle of review and redetermination embodied in the Renegotiation Act of 1951, but it is concerned that defense contractors cannot ascertain "with any degree of accuracy" the application of statutory factors in the Act "so that their business relationships with the Government might be so ordered that they will not be subjected to statutory renegotiation."

- Renegotiation "ground rules relating to earnings and profit must be more certain so that such long-range expenditures can be made with a degree of assurance."

- "To delay timely determination of profits for as much as 4 years is unfair to the Government and unfair to the contractors who are expected to plan for the future."

- "Congress must immediately initiate a restudy not of the principle of recovering excessive profits but of the application of the statutes and the regulations and conduct of the Board itself."

- The 12 airframe companies have "widely varying policies" on executive compensation. The AF and Navy have

AF Runs Evaluation Tests on Temco 51



An Air Force evaluation team has completed flight tests of the Temco Model 51 primary jet trainer. Temco already has received an order for 14 of the jets from Navy, which will evaluate feasibility of starting student pilot flight training in jet-propelled aircraft. Navy has designated new trainer TT-1. It is Temco's first production aircraft.

different policies on allowances for forms of compensation. And "there has not been forthcoming, from the Department of Defense, any statement of a unified policy." Therefore, "all of this means the same welter of confusion which has heretofore existed."

- "The proposal to charge all executive salaries and bonuses, incentive or otherwise, as cost allowances on Government contracts is unwarranted . . . and we think it unnecessary . . . that excessive executive compensation should be made a part of the cost or overhead for performing Government contracts."

- All services should set up, at a "reasonably conservative" level, a salary allowance schedule for executive compensation to be included in the general overhead cost allowances assigned against various Government contracts. All additional compensation should be paid "out of the profit earned on Government contracts."

- The Government wage scale for contracting personnel "is grossly inadequate," and a "reappraisal of qualifications and salaries of Government civilian procurement personnel" should be made and salaries "promptly" adjusted with responsibilities.

- "The subcommittee concludes, on the evidence, that there has been no showing that, on the average, the profit allowed are excessive."

- Viewed as a whole and as a "contracting industry"—with low capitaliza-

tion and investment, offering skilled management, and incapable of surviving without military production—"It is our opinion that the Government is getting substantial value."

- "An examination of these plants and the personnel operating them is a source of confidence to the members of the subcommittee . . ."

- "The matter of scientific and engineering personnel required in this industry assumed alarming proportions as the subcommittee visited plants and talked with the personnel concerned with this subject."

- "Both Government and industry share the duty of stimulating the sources which will produce needed personnel, both as an asset to business and as a need for the Nation." The 12 airframe companies have, "in a commendable fashion and within the limits of their competence and responsibility, endeavored to do something . . ."

- "The high rate of attrition among scientific and engineering personnel (approximately 17 percent) and shortages, are the causes of very large advertising expenditures. For that reason, it is the subcommittee's view that efforts and expenditures made to aid and assist in the education of scientists and mathematicians are quite as important as advertising and recruiting . . . The only satisfactory solution is to produce more engineers and scientists from our school systems, and, therefore, aid in that field is, we be-

lieve, a legitimate charge against the present contracts."

- "The presence of retired military personnel on payrolls, fresh from 'the opposite side of the desk' creates a doubtful atmosphere . . . Companies whose business is so closely interwoven with the Military Establishment ought to lean over backward so that no suggestion of favoritism, influence, or 'old school tie' could be read into their conduct."

- "Several companies have employed retired personnel on what are plainly jobs calling for special skills and not policymaking or management. We think such competence should be utilized." ♦♦♦

Earl N. Findley Dies

Earl Nelson Findley, 78, editor and publisher of U.S. Air Services magazine, died in Washington, D. C., on July 11 after a heart attack.

Mr. Findley began to specialize in aviation writing in 1908 while he was with the *New York Tribune*. From 1915 to 1917, he wrote for the *New York Times*' Sunday Magazine. During World War I he was a captain in the Aviation Section of the Army Signal Corps, and served as chief of the technical data branch, information division.

On Dec. 5, 1918, Mr. Findley was appointed editor of U.S. Air Services, and the first issue appeared in February, 1919. He became owner and publisher in 1925.

Stroukoff YC-134 Assault Transport Nears Roll-out

Stroukoff Aircraft will roll out its first YC-134 Air Force assault transport and support aircraft at its West Trenton, N. J., plant early this fall.

YC-134 will feature boundary layer control and the Stroukoff-developed Pantobase all-surface landing gear. In addition to Pantobase, plane has four main landing wheels, paired in tandem, and a nose gear.

Powerplants will be two Wright Turbo Compounds, each turning four-bladed Aeroproducts propellers.

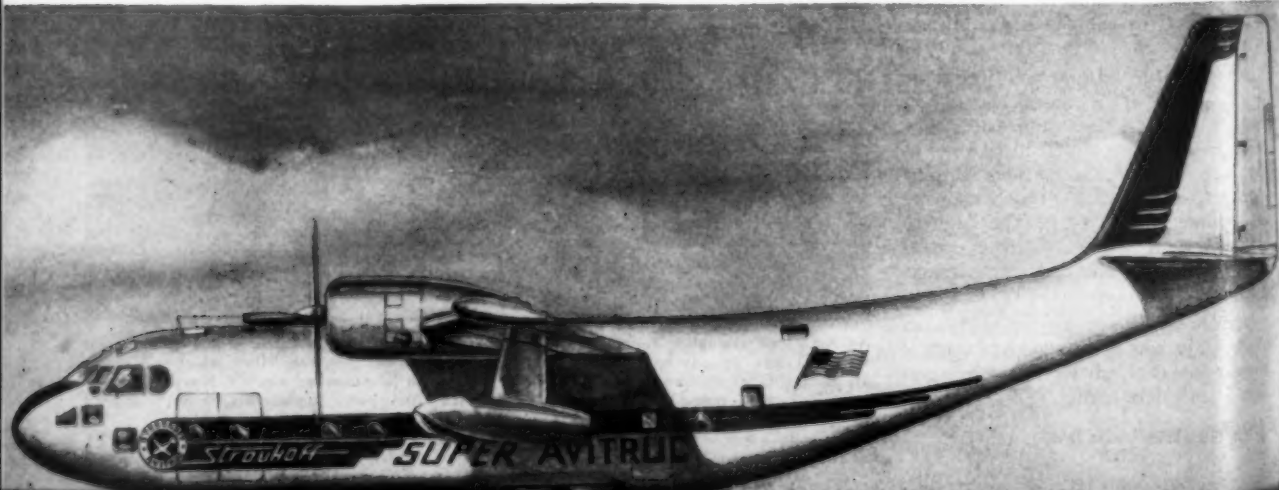
Both the BLC and Pantobase systems were designed and developed for USAF and integrated into two C-123 experimental aircraft built at the Stroukoff plant.

Experiments with the Pantobase ski-type landing gear have shown it suitable

for landing and takeoff from ice, snow, rivers, lakes, unprepared terrain, sand and standard runways, the company reports. Air for BLC is provided by auxiliary-powered compressors.

Wing span of the YC-134 is 112 ft.; overall length is 83 ft.; rear cargo door is 110 in. wide by 118.75 in. long; forward cargo door is 90 in. long, 60 in. wide. Design gross load is 25,000 lbs.

Artist's conception of commercial version of Stroukoff YC-134 cargo aircraft.



NAA Navaho Has Edge in Missile Race

By HENRY T. SIMMONS

Despite the rush to develop and introduce long-range ballistic missiles, it is likely that at least one intercontinental air-breathing non-ballistic missile will find its way into the nation's arsenal. Indications are that it will be the North American ramjet-powered Navaho.

This conclusion was drawn from an exclusive interview with Eger V. Murphree, Special Assistant for Guided Missiles to Defense Secretary Charles Wilson.

"I think at least one air-breathing missile has a place in the U.S. military force," Murphree said. "It will probably be produced in quantity when development is completed."

• The 57-year-old missiles "czar" did not say definitely whether the Navaho would get the nod over the Northrop J57-powered Snark, noting that he has made no decision in the matter.

Murphree explained, however, that development of the Snark has taken longer than expected, and that the Navaho represents a bolder concept in terms of the state of the art than the Northrop weapon. The latter recently covered a distance of 2,000 miles in a test firing at the Air Force's Cape Canaveral, Fla., test range extending into the South Atlantic.

Murphree indicated that the Air Force program to develop an intercontinental ballistic missile is going ahead smoothly. Asked whether it has encountered any roadblocks to date, he replied: "Some of a very minor nature. But it's really too early to hit them. I think our troubles will come later."

The missiles boss gave no hint as to when a fully-developed ICBM will be achieved. But he and his chief aide, Rear Adm. John H. Sides, former commander of the Navy's first Guided Missile Cruiser Division, said they are devoting most of their time to the ballistic missile programs of the three military services. Sides estimated that approximately 75% of the office's work is devoted to the ballistic program.

This is in line with the Wilson directive creating Murphree's office last March. It provided that he will "devote major emphasis to missiles of the long-range type, particularly ballistic missiles." The directive also stated that the missile czar's responsibilities would cover unmanned weapons up to the point where they are "adapted for service use."



EGER V. MURPHREE



RADM. JOHN H. SIDES

• Unlike Lt. Gen. James Gavin, Army Research Chief, and Gen. Nathan Twining, USAF Chief of Staff, Murphree is not optimistic about the chances of devising an adequate U.S. defense against hostile ballistic missiles.

"I don't think its been established you can have adequate ballistic defense," Murphree stated. In any case, he added, "the level of defense that can be obtained must be weighed against the indicated very large cost and complexity of the job."

(Gen. Gavin has expressed confidence that the Army will be able to work out a ballistic missile defense within four years, while Gen. Twining has said such a defense will be available when the first operational ICBM weapons are introduced. But it's not clear

whether the two military men have taken into account the staggering cost of an effective system, even if one is technically possible. Thus the outlines of an unresolved but increasingly important question are beginning to take shape: can the nation evolve an effective ballistic defense in terms of kill rate, and if so, can it afford to build such a defense?)

Murphree made these points about the missile development program:

• Manned bombers will certainly remain effective weapons for the next five to ten years, but there is a real question as to their usefulness in the long-range future, i.e., a generation or more.

• Limitations on the performance of air-breathing missiles have not yet been established and it may develop that heat and other barriers may prove to be the limiting factors rather than propulsion. It is therefore possible that such propulsion devices as the air-breathing ramjet will remain useful much longer than suggested in some quarters.

• "A study is being made of the relative merits of the (Army) Nike and (Air Force-Navy) Talos antiaircraft missiles." As to the chances of a "duel" between the two, he said: "Well, such test data as we need we will get." Regardless of the outcome of the study, he said, it is very unlikely that present Nike batteries would be replaced. (The dispute is over whether the advanced Nike B will be ordered for future missile defense batteries, not whether the present Nike I will remain in use.)

• "There is apparent duplication in certain plans in the missile program. But I don't think as yet we've found cases where there were not reasons to continue such projects."

Apparent Duplication Misleading

Adm. Sides explained that the apparent duplication in missile projects is misleading. In the case of air-to-air weapons, he said, some missiles operate well at high altitude, while others must be specially rigged to track low-level targets in the face of ground radar "clutter."

Thus the multiplicity of weapon types performing a single function is necessary because of the different performance characteristics required for various missions.

• The general tendency in missiles is to build more brains into them to make them less dependent on directions from the ground, "particularly as you get out in range." ♦♦♦

What Will AF Do with Its Extra \$900 Million

Indications are B-52 will have relatively low priority, but KC-135 will be pushed; \$100 million definitely earmarked for R&D.

Recommendations for spending the extra \$900 million voted the Air Force are expected shortly from Chief of Staff, Gen. Nathan Twining, but the big question remains: Will Defense Secretary Charles Wilson approve the plans?

With his Soviet trip behind him and the Fiscal 1958 budget ahead, Twining is mulling over which of the many needs within his establishment are to be met—at least partially—with the extra funds voted by Congress over Wilson's protests. While the additional money will not be impounded, Twining so far has received no assurance that the Defense chief will okay its commitment against new AF projects.

Although it is far from clear how the Air Force would like to spend the additional money, there are indications that the B-52 currently has a rather low priority. In a New Orleans TV broadcast, Twining said there are "several ways that the money could be spent besides on B-52s." He made these points:

- The Air Force would like to bring along the Boeing KC-135 tanker faster. (AF witnesses have testified that the jet tankers will sharply step up the capability of the jet bomber force.)

- Of the additional funds, \$100 million has been earmarked specifically for research and development. (It is likely that the Air Force can get approval to commit this money more readily than the balance voted for aircraft. This would ease the drain on its R&D funds which has resulted from the decision to give the ICBM and IRBM projects top priority.)

Twining Moves Cautiously

Since his return from Russia, Twining has moved cautiously to avoid conveying the impression that he is in open disagreement with Secretary Wilson. His task has been complicated by Sen. Stuart Symington's (D-Mo.) charge early this month that Wilson's testimony on U.S. airpower has been in "direct conflict" with that of top military officers.

Evidence of Twining's effort to carry water on both shoulders—to support the AF funds increase as well as the Administration defense program—was apparent in his New Orleans TV broadcast. He said on the one hand that he thinks the programs which were before the Congress "are adequate and will do the job when we get these forces built," and on the other hand, that he will "make recommendations" to Wilson and AF Secretary Quarles

"as to how it (the extra money) best can be used."

- Despite Twining's attempts to gloss over his differences with his civilian boss, it's virtually certain that the Symington Airpower Subcommittee will play up the disagreement when it issues its report on the three-months-long investigation. Also likely to play a prominent role in the report is the top airman's private appraisal of his visit to Russia to examine Soviet airpower.

As for the details released or public version of Twining's impression of Soviet airpower, these details were released:

- Most important of the new Soviet aircraft on demonstration was the twin-jet, allegedly supersonic Blowlamp which will presumably replace the Il-28 Beagle, several thousand of which have been produced.

- The Russians are keenly interested in the range extension possibilities offered by aerial refueling and are working on both a "flexible" and a "rigid" approach. The party saw one example of a refueling hook-up—a 50-foot length of four-inch hose attached to the wingtips of two Badger twin-jet medium bombers.

- In at least one plant, the Russians are using "job shop" methods and fairly simple tooling to manufacture VK-1 Nene engines, used in the MiG-15 Fagot and other older aircraft. "Worker discipline, the production scheduling and the quality of output impressed my people as being good."

- Another plant on the itinerary was producing Il-14 twin-engine transports, a cross between the U.S. DC-3 and Convair. The plant produced about 85% of the airframe under its own roof, compared with about 60% in the

U.S. "We concluded that owing to such factors as lack of automation and of high-production tooling and presses, the production per man hour is considerably less than that achieved in the U.S."

Technical Equipment Impressive

- Most impressive features of the Zhukovskii Air Engineering Academy were the quality of the instructors and the wealth of technical equipment. "A Mach 3 wind tunnel was actually demonstrated to us. The aircraft model used was a true Delta design. From the shock waves produced when it was subjected to the ultra-sonic airstream it was clear that this tunnel was a bona fide Mach 3 testing device."

- The party got a glimpse at the tactical concerns of Soviet aviation in a visit to the Monino Air Academy. Classroom exhibits demonstrated fighter tactics, air attacks upon a naval carrier formation, and nuclear warfare.

- "Completely missing from the array of exhibits were any guided missiles, even of the most elementary kind . . . our hosts maintained a veil of secrecy around their activities in this field of weapons and could not be drawn into serious technical conversations about them."

- On the basis of the aircraft displayed, Twining concluded that the Soviet Air Force is developing a "surprisingly wide" variety of aircraft reflecting a "high level of scientific and engineering talent."

- "Despite the undeniable strides made by Soviet designers, they have not outdistanced us. Nothing we saw could honestly be described as being superior to the best U.S. aircraft in comparable categories."

In this connection, the party noted that the Soviet designers are having air stability problems at high speed, just like their U.S. counterparts. This was apparent from the use of fences and foils to adjust airflow over the wings and control surfaces of advanced Soviet aircraft.

- "Our findings do not justify any hasty action to write down, or for that matter, to write up our previous assessments of Soviet air power . . . our visit did have the positive effect of strengthening our previous judgment that the rate of progress and improvement in Soviet air weapons—backed by a massive scientific and industrial effort—is such as to give us cause for serious thought about the future." ♦ ♦ ♦

Two Boeing Test Pilots Get CAA Jet Ratings

First CAA jet transport pilot ratings have been issued to A. M. (Tex) Johnson, chief of flight test for the Boeing Airplane Co., and R. L. Loesch, senior experimental test pilot, in the Boeing 707.

R. T. Johnson, CAA air carrier safety division agent in Seattle, issued the new type ratings after conducting the necessary flight tests. Johnson and Loesch piloted the prototype 707 on its maiden flight.

U.S. Acts to Unjam Crowded Airways

By LOIS C. PHILL 'US

Deeds are finally replacing words along the airways. With the full support of President Eisenhower, CAA's supplemental request for \$68.4 million for airways facilities became the dramatic climax to a House subcommittee investigation of aviation facilities and the government organization handling them.

A powerful contributing factor was the tragic mid-air collision over the Grand Canyon between TWA and United, which will certainly insure both Congressional and public support for the additional money. If fully approved, CAA will have more than \$108 million to spend on new facilities in fiscal 1957.

An official proposal to shorten the five-year airway plan to three years or less was offered by Rep. George Mollohan (D-W.Va.), chairman of the House Government Operations subcommittee, following four weeks of testimony by airline, Air Force and CAA officials who all stressed the urgency of speeding the program.

• The consensus was that while the five-year plan was a step in the right direction, quicker action was needed. David Thomas, CAA's new director of Air Traffic Control, joined in the chorus. While he defended the system as not being obsolete, he did stress that expansion and improvement could be used at once.

Originally CAA Administrator Charles J. Lowen testified that it might not be feasible to accordon the \$246-million program in fiscal 1957 because of the severe shortage of trained technicians to man the new aids. But, he later told AMERICAN AVIATION, a re-study showed that "time could be bought" by procuring certain equipment in the current year, and commissioning it after personnel are trained.

Coinciding with this "crash" plan must come "intensified training to ready more people for higher control responsibilities," Thomas told the committee. There are "too few experienced personnel to promote to take care of expansion as rapidly as it should be handled," he declared.

• CAA personnel officer Jay Meisel revealed that there had been no recruitment or training of replacements for the 110 traffic controllers lost from January through May. Insufficient budget was blamed. It seems obvious now that the necessary apportionment will be made to build up the training program.

Another decisive step being taken

under CAA's new leadership is the proposed amendment to Civil Air Regulations to improve VFR flying safety. A proposal to raise the minimums in control zones from the present 1,000 feet and three miles to 1,500 feet and five miles was made to the Civil Aeronautics Board last week.

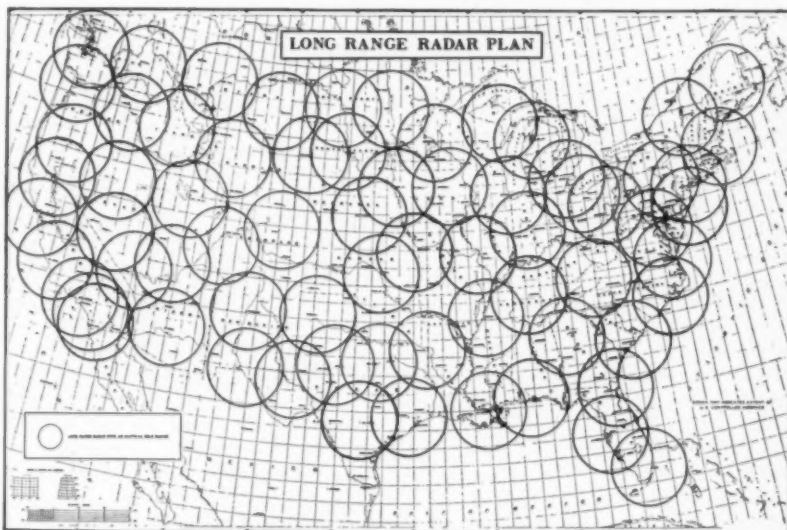
To follow shortly will be a pro-

posed amendment to CAR Part 60 to raise the present 700-foot floor in control areas to about 1,500 feet, CAA Safety Director William Davis revealed. Industry viewpoints have ranged from "laissez-faire" to desire to have the floor at 3,000 feet.

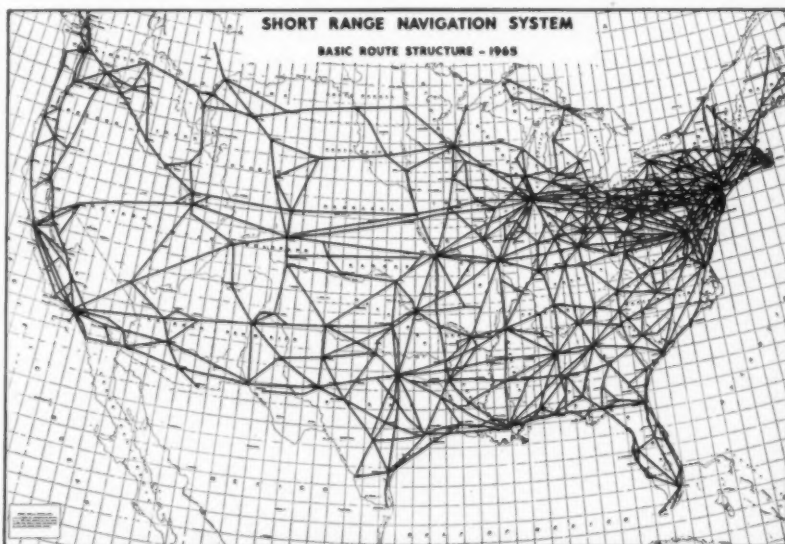
• Davis feels strongly that with more realistic VFR minimums "mid-

WHAT CAA HOPES TO ACHIEVE IN THREE YEARS

Estimated dates are dependent on delivery schedules



By ordering 31 instead of 18 long range radar systems in fiscal 1957, CAA expects to step up its nation-wide coverage by two years, with a total of 73 radars installed by late 1959 instead of 1961.



By doubling the VOR Omiranges in 1957 (from 75 to 156), about 881 stations should be operating a year earlier than the 1961 date contemplated in the original five-year plan.

air collision problems will be alleviated." Other new regulations being considered by CAB are: (1) establishing navigation facilities and safety standards for instrument airports at uncontrolled airports; and (2) requiring adherence to traffic patterns while operating on and arriving at an airport, as well as when departing from it.

These are the immediate steps being considered. But a study of the subcommittee testimony clearly points up some definite trends which are likely to crystallize within the coming months. The committee probably will give a vote of confidence to Edward P. Curtis, special Presidential aide, in lieu of the proposed Hoover-Commission type study sought by Rep. George Meader (R-Mich.).

But CAA will continue to take a much stronger lead in day-to-day operations and planning. Lowen noted that CAA had the statutory authority to develop and operate the airway system and if it didn't fulfill the function "the Administrator should be fired."

• **The Air Coordinating Committee** will definitely continue, despite some severe criticism leveled against it. It has been labeled "a necessary evil" by Lowen. He was supported by the Air Transport Association and other government officials in contending that, if ACC were dissolved, something similar would have to be created. But its hazy powers may be redefined to either make it "the town meeting" Milton W. Arnold of ATA called it or strengthen it sufficiently to make it a clearcut policy-making body.

AAP Launches Guided Missile Magazine

A new monthly publication, **MISSILES & ROCKETS**—Magazine of World Astronautics, has been announced by Wayne W. Parrish, editor and publisher of **AMERICAN AVIATION** Publications.

With the first issue appearing in October, the managing editor of the new periodical is Erik Bergaust, missiles science editor of **AMERICAN AVIATION** Magazine and a recognized authority in the rocket propulsion and guided missile field.

First and only publication of its kind, **MISSILES & ROCKETS** will serve management, engineering, production personnel and other leaders in the manufacturing and research categories of missiles, rockets, upper air research satellite science and astronautics.

The growing market to be served by the new magazine is evi-

denced by the increase in expenditures for guided missiles alone from \$21 million in 1951 to an estimated \$1.2 billion for 1957, not including money allocated for basic research in the fields of upper air research and satellite science.

Guiding editorial policy of **MISSILES & ROCKETS** will be an advisory board composed of some of the most eminent scientists in the world. The board includes Dr. Wernher von Braun, Redstone Arsenal; Andrew G. Haley, Chairman of the Board, the American Rocket Society; R. P. Haviland, Flight Test Planning Engineer, General Electric's Special Defense Projects Department, Philadelphia; Alexander Satin, Chief Engineer, Air Branch, Office of Naval Research; Frederick C. Durant III, Arthur D. Little Co., Inc., and President of the International Astronautics Federation, and others.

How CAA's \$68,043,000 Is To Be Spent

Airways Established—\$54,075,000

\$21.7 million Communications and navaid for high altitude control
14.0 million 13 additional long range radar
11.0 million 23 ASR's (airport surveillance radar)
6.8 million 80 VHF omniranges

Operation & Regulations—\$13,968,000

\$12.2 million Airways, including increased staffing at control centers; technical training; upgrading of controllers.
1.7 million Office of Aviation Safety: start retrenchment of designees system; technician for certifying jet transports.

The Air Navigation Development Board will not fare as well, however. Irked by its usurpation of unauthorized powers, Commerce officials privately would like to see it consigned to the scrap heap. To strengthen the push for its demise, CAA is hard at work developing finalized plans to expand and improve its own Technical Development Center at Indianapolis. Modernized and streamlined, TDC could well become the center for development of Common System aids—thus lessening the need for ANDB.

Arnold has already written ANDB's "obituary" (**AMERICAN AVIATION** July 16) and the handwriting is on the wall. While attempts may first be made to reorganize it, possibly by adding a third voting member to break the Commerce-Defense deadlock, its usefulness will fast diminish with functions transferred to both CAA and Curtis' office.

How much credit the Molohan subcommittee can take for the rapid action now replacing the numerous investigations and interagency forums is, of course, a moot question. But it certainly has served as a good sounding board, aiding officials to crystallize their own thinking and presenting problems and solutions in one neat package.

The four-week hearings were a fitting climax to the longer series of discussions and investigations. If nothing else, they served to educate and inform both Congress and the public—no small task. ♦♦♦

Dual Fuel System For Ramjet Copter

Hiller Helicopters has developed a modified dual fuel system for the H-32 ramjet helicopter, to preclude the possibility of simultaneous engine failure because of fuel system malfunction.

Hiller engineers also are working on a method of controlling cockpit contamination in the ramjet. First of the Army H-32s is to be delivered shortly. Three HOE-1s built for the Navy were delivered earlier this year and are at the Patuxent River test station.

NBAA Director Resigns

Resignation of Jean H. DuBuque as executive director and secretary of the National Business Aircraft Association has been announced by Henry W. Boggess, president. He is being succeeded by William K. Lawton of Miami effective August 1.

Lawton has been advertising and public relations director for the L. B. Smith Corp. of Miami. He is a commercial pilot and at one time was an airline dispatcher. He holds a degree in journalism from New York University.

DuBuque, who held the post for about two years, has not yet announced his future plans.



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Symington Probe Ends, But Political Fireworks Will Be Exploded Later

Sen. Stuart Symington's three-month-old investigation of U.S. airpower ground to a halt last week, barely ahead of the adjournment of Congress itself. But the fireworks were not over.

Still to come, piece-by-piece, was the secret testimony before the Airpower Subcommittee of the three military chiefs of the armed services. Add to that the final, closed-door session with Gens. Twining, Putt and Irvine on July 19, for the dual purpose of: (1) getting more details on their Russian observations and (2) resolving or isolating the "conflicts" between their views and those of Defense Secretary Wilson.

And finally, the subcommittee report. That politically significant document which can be expected to bristle with findings, charges and recommendations—the powerful, refined essence of hundreds of hours of top-secret testimony from more than a hundred of the nation's top military leaders.

Criticism Expected

• That it will be severely critical of Administration policies governing the readiness of U.S. air forces is taken for granted.

But the manner in which the criticism will be made, the targets of the charges, the new revelations that might show up, and the overall persuasiveness of the Symington case—all this remains to be seen, and to be judged in whatever political or military context prevails later this summer.

And not least important will be the timing of the report. Subcommittee sources indicate they don't expect to release one for another three weeks, more or less. This could move the report into the middle of political convention time, with the Republican Party meeting in San Francisco beginning August 13, and the Democrat Party gathering in Chicago August 20.

It requires no great imagination to picture Sen. Stuart Symington—already the Democrats' number one dark-horse presidential possibility—flying into convention hall on the wings of a sensational, documented charge that Republicans have critically weakened the Nation's power to defend the free world.

• Meanwhile, however, the Administration has offered its last word to Symington, in the form of a letter from Defense Secretary Wilson. Defending himself against Symington's charge that his testimony was "in direct conflict" with that of some of his military officers, Wilson insisted there was "general accord" in their positions.

He readily agreed there were some

"differences of opinion," but he explained, "I consider it normal for divergent opinions to exist whenever individuals express their honest views on complicated and important matters and have different degrees of responsibility."

Wilson took the occasion, too, to reassert his position on two matters of concern to the subcommittee:

• He does not intend to impound the extra \$900 million in AF appropriations voted by the Congress; he intends, instead, to carry out Congressional intent (presumably stepped-up research & development, and procurement of more B-52s and other advanced aircraft) subject, however, to "limiting factors proposed by the Congress itself," to recommendations of AF Secretary Quarles, and "to the best of my own judgment as to the security needs of the nation."

• He believes the U.S., in "overall air strength," is today ahead of the Russians, and that "we intend in the future to build and maintain total air strength capable of preserving the security of the U.S., and as a visible deterrent to wars of any kind."

Apparently unable to resist the temptation, Wilson tweaked Symington with this thought about questions on the relative air strength of the U.S. and USSR: "Depending on how such a question is phrased," he wrote, "any one of a number of assumptions could be proven by the best intelligence estimates available."

Highlights of Testimony

Nevertheless, facts and opinions and intelligence estimates still poured out from the Symington subcommittee. During the past fortnight, these were the highlights:

• Gen. Twining, AF Chief of Staff, reported to Congress that the Russians confirmed his earlier impressions that they are making "undeniable strides" in military aircraft; that they are progressively narrowing the U.S. technological lead; that Soviet designers are now "pioneering" and have developed "a surprisingly wide variety of aircraft." (See page 24).

• Navy air and missile officers testified that carrier-based aircraft can now strike strategic targets within Soviet Russia. They conceded, however, their capability was "on a very much smaller scale" than that of the Strategic Air Command, and their primary mission was to support the fleet and attack coastal installations.

R. Adm. John E. Clark, Director of the Navy's Guided Missiles Div., revealed he expected to be "reasonably

sure" of the form the Jupiter IRBM will take within the next year. Ship designs are now being studied for the missile, he said, and the Navy "could build a submarine and have it ready shortly after" the missile is ready.

Real Navy enthusiasm—apparently shared by Sen. Symington—was reserved for its big XP6M, a weapon whose strategic capabilities are expected to include a combat ceiling "in excess of 40,000 feet," an unrefueled combat radius "more than 1,500 miles," "a heavy weapons payload," and the ability to land and take off in 4- to 6-foot waves.

Gardner 'Bets' on U.S. Scientists

• Former AF Asst. Secretary (R&D) Trevor Gardner bluntly told the subcommittee the USSR is leading the U.S. in development of an IRBM, but he said he placed his bets for an ICBM on American scientists.

Gardner's explanation: the Soviet Union has proceeded "step by step" in missile development, while the U.S. "decided to go for the ICBM in one jump."

There was hope, Gardner agreed, that the U.S., despite the present Soviet lead, might perfect an IRBM "about the same time they do." The key to U.S. efforts here and on the ICBM project, he emphasized, was the "management structure." The "15 or 20" missile projects were slowing down and dispersing the effort; there was too much competition for engines, engineers, and test-range time.

• Gardner's former AF colleagues were not so ready to criticize. Gen. B. A. Schriever, in overall command of AF ballistic missile development, was confident his top-priority ICBM program is now proceeding "about as fast as it can go."

Both Schriever and ARDC Commanding General Thomas S. Power agreed they could not point to a single tangible factor that "has created an adverse effect on our ICBM time schedule by the introduction of the IRBM." They noted, however, that "a very substantial increase in workload" has been pressed on top officials who must coordinate Army, Navy and AF missile projects. ♦♦♦

CAA Tests on Aerocar Flying Auto Delayed

Start of CAA type certification flight test program on the Aerocar flying automobile at Longview, Wash. has been delayed pending correction of a flutter deficiency and repair of the test airplane.

The flutter developed in a recent test flight, causing permanent set in the airplane structure in several places. The plane, however, was landed safely.

How GE Tackles ICBM Heat Problem

By ERIK BERGAUST

In a super-modern multi-million-dollar headquarters building in Philadelphia, General Electric's Special Defense Projects Department is conducting the most secret of all secret projects in the country today. It's the spectacular nose cone development for the Atlas ICBM, the 107A Weapons System, and it's progressing ahead of schedule.

Of 600 subcontractors and vendors some 150 are in on the WS 107A program; the others are helping GE complete several other missile projects.

• **Nose cone development** for the Atlas ICBM is an industrial challenge unequalled in modern research and manufacturing. GE scientists compare the task with that of mastering more than six times the heat transfer in the world's largest steam turbine. New concepts in aerophysics and thermodynamics are encountered. Metallurgy of the most complex nature must be tackled.

The question has often been asked why General Electric was awarded the important ICBM contracts to develop the guidance system and the intricate nose cone for the Atlas missile. How did General Electric get into missile business?

The answer is simple. GE entered the ballistic missile field before any other American manufacturer. On November 15, 1944, the company got the Army Ordnance contract to conduct the famous V-2 program. Under this contract 102 missiles, most of them ballistic (V-2 and Hermes) were fired.

And since GE can correctly say that it has more experience than most of its competitors in the fields of high-pressure synthetic diamond research, basic and applied metallurgy research, and advanced research in physics and chemistry, it was logical to consider GE for the tricky ICBM nose cone development. After all, the \$3.5-billion company—spending millions of dollars of its own money for research—has often proved that it is willing to tap its own resources to pursue a defense program.

• **The GE Special Defense Projects Department**—a fancy name for a guided missile division—was formed May 25 last year. It is now becoming a multi-million dollar business with headquarters in Philadelphia and with a temporary laboratory in Germantown, Pa. In 1958 its new Valley Forge research and development plant will be ready for the advanced phase of the WS 107A program and other missile projects.

But GE's Special Defense Projects Department anticipates that actual production of missile components will be given to other GE departments or conducted in brand new plants, if necessary.

Under firm leadership of George Metcalf, the SDPD has already accomplished more than its primary objective, that of obtaining the ICBM nose cone contract. The department has been awarded the nose cone contract for the IRBM Thor as well.

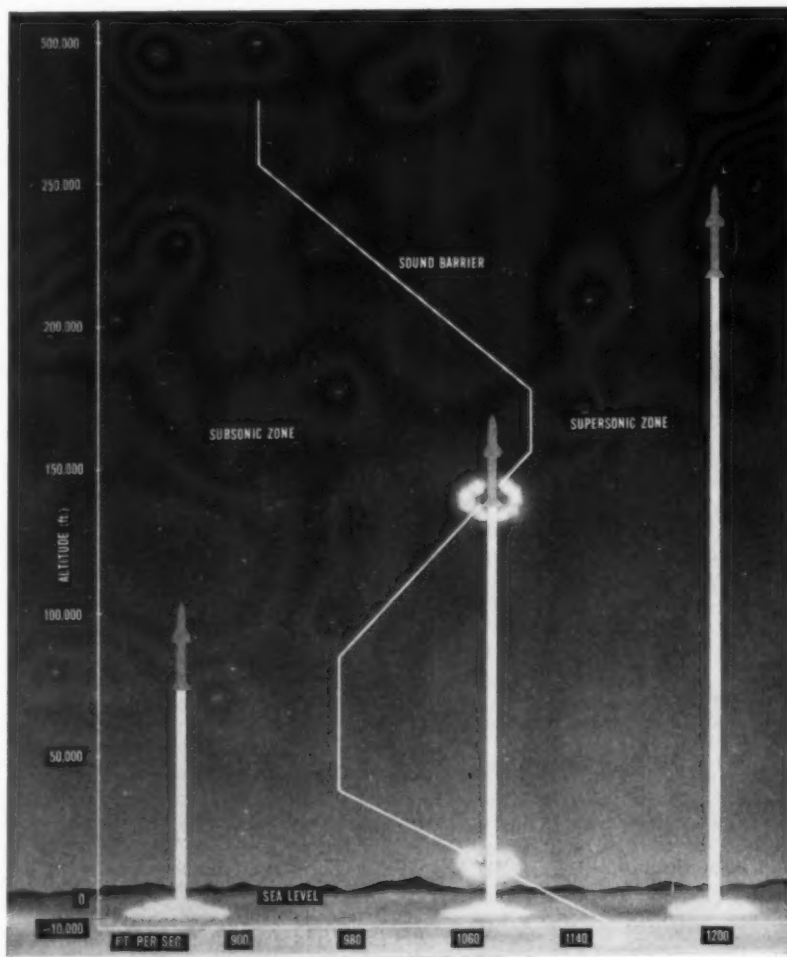
Aerophysics Complex

• **The aerophysics** involved in the development of the ICBM nose cone is complex and sophisticated. At hypersonic velocities dissociation and ioniza-

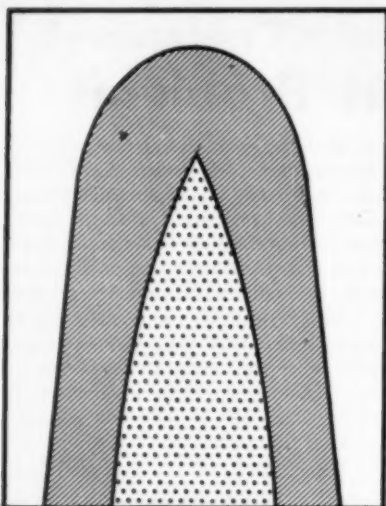
tion of the air surrounding a missile will influence the vehicle design. SDPD's Dr. John W. Bond, Jr., aerophysics expert, points out that ICBM development requires a considerable amount of theoretical and experimental research in the fields of atomic and molecular physics.

When an object such as the ICBM travels through the atmosphere at velocities in excess of about 10 times that of sound, the air in the shock wave which precedes the missile becomes partially dissociated and ionized.

The analysis of the flow and heat transfer problems involves knowledge of aerodynamics, chemical kinetics and molecular physics. Consequently, a corps of scientists from many fields is needed



Re-entry into the atmosphere of an ICBM nose section (warhead) might involve breaking through the sound barrier as many as three times, because of complex characteristics of sound barrier at various altitudes. This phenomenon presents a major problem for designers of ICBMs, since exceptional disturbances are encountered every time nose section passes through sound barrier.



Artist's conception of blunt-shaped Atlas ICBM nose cone compared with V-2 needle-shape nose.

to solve the nose cone problem.

• The largest gas shock tunnel in the country is now under development at GE. It will be used by the ICBM scientists to solve some of the temperature problems connected with the nose cone project. This tube will be able to simulate conditions encountered at extreme hypersonic velocities. Furthermore, GE is also studying the feasibility of a mass accelerator, a device capable of simulating extremely high speeds by help of electrical currents.

At the high speeds anticipated for the ICBM the heat transferred from the air to the missile might become large enough to cause melting, oxidation, sputtering or other deleterious effects. GE scientists are studying the possibility of absorbing the heat at a relatively high rate.

Various physical processes such as viscosity, diffusion, thermal conductivity, radiation, dissociative and electronic recombination, electrical recombination and compressible flow are all different in the ICBM speed regime than at low Mach numbers. General Electric, therefore, has called upon all its departments to cooperate in the ICBM nose cone development program.

\$1.4-Million Laboratory

Until the huge Valley Forge research and development facility is ready in 1958, most of the ICBM work will be conducted in the Philadelphia headquarters. Under the ICBM contract \$10 million will be invested in a new aerosciences laboratory, also in Philadelphia. The shock tube will be installed here, while the actual model work and experimenting on the full-scale ICBM nose cone will take place in the headquarters building, Philadelphia.

Some 850 people are currently employed by the SDPD. More than half of these are scientists directly connected with the ICBM or the other missile projects. Engineers are hired every day. By 1959 more than a thousand local Philadelphia engineers, technicians, machinists and clerical personnel will be added to the SDPD staff for work on the mightiest of all weapons. Additional engineers from all parts of the country will be marshalled for the ICBM nose cone job.

It is, rightfully, absolute taboo for SDPD personnel to discuss schedules, performance data, weights, dimensions, metals specifications and the like in connection with the various missile projects now in the mill. It is difficult enough for GE scientists to talk about aerophysics in general; not even the amount of money involved can be revealed.

It can be said, however, that the entire aircraft and missile industry is watching General Electric in its drive to become the world's leading guided weapons manufacturer. And it is absolutely true that the company is well on its way toward that objective.

Submarine Missile (SLIM)

In addition to the ICBM, GE and other missile makers are reported to be highly interested in solid-propellant submarine missiles.

For more than a decade the Russians have been busy developing solid-propellant missiles that can be fired from submerged submarines against surface targets. The Russians picked up some valuable German hardware at Peenemünde. But not until recently has our own Navy admitted that such weapons seem feasible.

The solid-propellant Slim missile can be launched through conventional torpedo tubes or from a deck-mounted launcher.

ARDC Biggest Customer

• Biggest customer of the Special Defense Projects Department is the Western Development Division (WDD) of the Air Research & Development Command. In addition to building equipment for WDD's long-range ballistic missiles, some down-range instrumentation has been planned. The new shock tunnel, and the mass, or electromagnetic, accelerator, are parts of the ICBM nose cone contract.

The other primary contractor is the Army Ordnance Corps at Picatinny Arsenal. A variety of projects directed eventually toward the design and production of missile arming and fusing systems are carried out. The Picatinny projects have several particularly attractive advantages, from SDPD's point of view. The scientists know that con-



George F. Metcalf.

ventional arming and fusing systems are not sufficiently accurate; much room for product improvement exists.

Since no competitor has really established himself in this market, the SDPD is trying to get a head-start. Considerable work is also being done for the Navy, but all contracts are classified.

Indicative of the eagerness of the SDPD is that most of its scientists and engineers are very young, but have an average of over five years experience in the missile field. With a new employment policy aimed at giving missile engineers more responsibility and less inter-office red tape General Electric's SDPD is bound to gain ground in the missile business rapidly. In view of the sad fact that the Government was much too slow in getting the ICBMs on their way, it is gratifying that private industry is really pushing them. ♦♦♦

The Atlas project is now proceeding "about as fast as it can go," according to Maj. Gen. B. A. Schriever, Commander of ARDC's Western Development Division. He recently told the Symington Airpower Subcommittee that, despite an unprecedented "highly-compressed development schedule," the ICBM project has met its "milestones" and, he is confident, will meet its testing and production schedules.

Missile Training Range

A major guided missile training range is being established by the Navy at Bonham AFB on the island of Kauai, 110 miles west of Pearl Harbor on Oahu, T. H. About \$500,000 in contracts for refurbishing and construction work will be let soon.

The Navy will move Guided Missile Group One from the west coast to Barber's Point, Oahu, in August. This force will operate jet and conventional drones from Barber's Point NAS until Bonham is ready.

Behind the Scenes at Russian Air Show

By ANTHONY VANDYK

MOSCOW—The Russian secret police ceded Vnukovo airport to the U.S. press on July 23, the day Air Force Chief of Staff Gen. Nathan F. Twining and his party arrived at the field. The ramp was completely unguarded and correspondents and cameramen wandered to and fro in a manner that would not be permitted at Washington National Airport under ordinary circumstances; certainly never when a high foreign dignitary was about to arrive.

Gen. Twining's C-118 had a shine on it the like of which this writer has never seen on any aircraft other than the Vikings of the Royal Air Force's Queen's Flight. How many enlisted men must have been assigned to shining up the military DC-6 will probably remain as top secret as Twining's real impression of his hosts—but it must have been plenty.

Russian beer isn't particularly strong but those who had been consuming it before the C-118 arrived blamed it when they saw a set of aircraft stairs moving under its own power toward the Douglas transport. On closer inspection it was clear that the stairs were self-propelled with a position built in them for the operator. The unit could move around the field and adjust its height to suit the aircraft it was serving.

Gen. Twining was biting his lip nervously as he descended the stairs. His innocuous "glad to be here" speech gave further evidence that he was by no means at ease. Neither he nor U.S. ambassador Charles Bohlen seemed particularly happy about the visit. Bohlen clearly was disturbed that so many U.S. press representatives were in Moscow and took a negative attitude toward having them accredited to the U.S. delegation.

Scarcely had the Twining party left the airfield when the RAF's dele-



Admission ticket to the Russian air show is of a striking design. 450,000 were printed. On back of ticket were instructions on how to reach the allocated area of Tushino airfield.

gation landed in a Comet 2. Unlike the U.S. group, the British had a politician with them, Air Minister Nigel Birch. He made a flowery speech in response to Marshal Koniev's greeting. Koniev had been at the airport all the afternoon greeting the various delegations as they came in.

Showing rare affability, Koniev agreed to repeat his speech of welcome to the British before the TV news reel cameramen. He started speaking but there were immediate shouts of "Cut"—they weren't ready for him. Finally, he made his speech and was about to move away when there was a shout "Hold it a moment, Marshal, that was for CBS; now do it again for NBC." And he did!

When the British moved off the field about 250 Russians swarmed around the Comet. It was the first foreign jet transport that had ever been to Moscow. It made the flight from London in half an hour longer than Russia's Tupolev Tu-104. The Comet was parked next to the C-118

and shortly was joined by the aircraft that brought the French delegation—a twin-engine SO 30 Bretagne which looked rather sad even compared with the Russian Ilyushin Il-12s that were coming in and out of the field. It was a pity that the original French plan to come in a Caravelle jet was not implemented.

• Vnukovo airport is an interesting spot. At least 100 Ilyushin Il-12s and Il-14s can be seen there at any one time. The aircraft use their own batteries and no fire extinguishers are on hand when the engines are started.

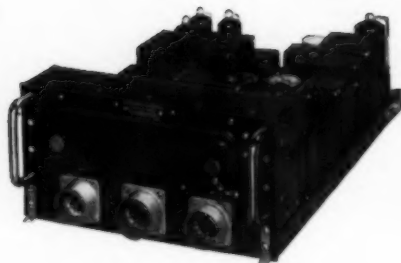
Aeroflot handles the aircraft of foreign airlines as well as its own, and seems to do a good job at it. The personnel, mostly clad in uniforms resembling those of American railroad men, seem well trained and efficient.

Despite a tremendous amount of goodwill on the part of Aeroflot, present arrangements for international travel to and from Moscow still leave much to be desired.

An example is the check-in procedure. The traveler bound for foreign

Ancient and modern antennas bedeck Moscow's Vnukovo airport. In foreground is a Tupolev Tu-104 jet. This aircraft is about to enter service on Aeroflot's international routes to Peking and Prague. First western airport to have regular Tu-104 service will be Copenhagen.





This is Honeywell's fire control coupler for jet interceptors. In conjunction with Honeywell's autopilots, it makes automatic interception a reality. Once radar has locked on the target, the fire control coupler slaves the autopilot to the radar, freeing the pilot for tactical decisions. This Honeywell coupler-autopilot team has already flown several classified interceptors.

AERONAUTICAL DIVISION, MINNEAPOLIS-HONEYWELL

points has to check in at the Intourist office at Vnukovo airport. Usually only one agent is on duty to examine tickets and process passengers despite the heavy flow of international traffic at the field. This writer had to wait one hour to check in. No English-speaking personnel were present but one official spoke German.

• The public address system at Vnukovo airport does not extend to the Intourist office and waiting room so passengers have to be on the lookout for an official who calls the flight in normal voice amidst the hubbub in the waiting room. The announcement is, of course, made in Russian. In this writer's case the official was a girl of about 25 who was not wearing uniform or bearing an armband or any insignia.

Passengers using the services of Finnair and SAS do a little better than those flying Aeroflot since these two carriers have English-speaking personnel present at their arrivals and departures. Aeroflot, however, is responsible for handling reservations for all airlines serving the Soviet Union.

Finnair flies Convair 340s from Helsinki to Moscow while SAS uses a Scandia on its flights to the Soviet capital. The Scandia is a specially converted 24-seat job (all other SAS Scandias have 32 seats) and is registered in Sweden.

• SAS is giving Aeroflot a lot of behind-the-scenes help in expanding the Russian airline's international operations. Tariff manuals are now being published by Aeroflot that are carbon copies of SAS manuals. Other documents and tickets were also recently revised with the assistance of SAS.

Link between Aeroflot and SAS is Lennart Rehnqvist who has all the attributes of a diplomat, businessman,



To the left of an SAS Scandia at Riga can be seen a Colt biplane and an old lease-lend B-25, both in Aeroflot colors. Passports are checked at Riga while aircraft are refueled and passengers fed on their way to and from Moscow.

official greeter and travel agent rolled into one. As SAS' Moscow manager he is the only foreign airline traffic man in the Soviet Union. He makes his headquarters in the National Hotel and is a one-man show—he has no secretary or assistant.

Another SAS official who runs a one-man show is the station manager at Riga. He also has the dubious distinction of being the only foreign resident in the city, the capital of Latvia. Most flights from Europe to Moscow make an intermediate landing at Riga or Wilno. Passport formalities are effected at these cities (there seems to be no customs examination for international passengers to Moscow at the present time) and passengers are given a meal.

The meal on the ground at Riga or Wilno is lavish (Aeroflot serves nothing but light refreshments in the air, there being no galley on the aircraft, merely a samovar for making tea or coffee and boxes of cookies). In fact, at times the meal is too lavish.

On a flight arriving at Riga on schedule at 5:45 a. m. this writer wasn't served breakfast but got hors d'oeuvres, veal cutlet, french fries and peas! On another occasion he had a five-course dinner to the accompaniment of a three-piece orchestra in full evening dress.

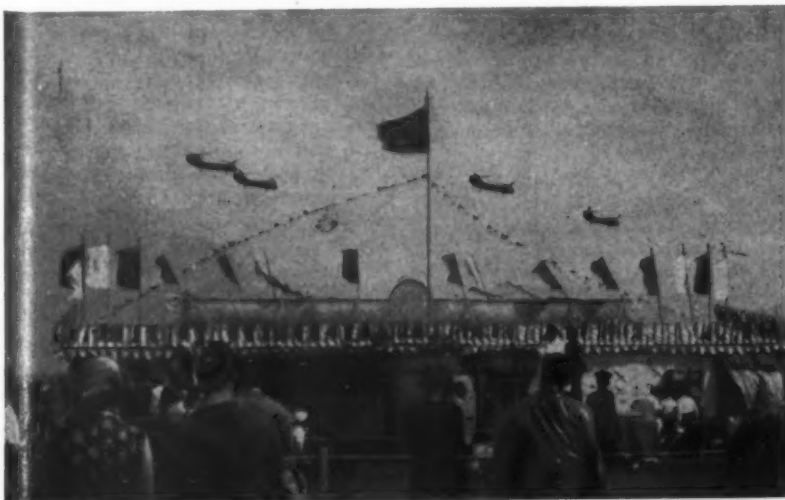
There is no reason why passengers should not be treated well for all fares to the Soviet Union are "first class"—the Iron Curtain marks the end of tourist fares. Nonetheless, the Il-12s and Il-14s which fly Aeroflot's international services are hardly first-class equipment. They were built as workhorses for domestic routes and as such are very good—they can get in and out of very small fields yet are as fast as a DC-4.

The only lavish item in the Il-12 is the toilet which is very large and of the "watch out below" type—no chemicals here. A pipe from the outside enables a hose to be connected on the ground for flushing out. The unit is massive and the entire washroom takes up the space of two of U.S. size.

The toilet for the Ilyushin transports is manufactured in the same plant in Moscow that builds the airframes. This plant employs some 5,000 workers and produces all components except the engines and wiring. No subcontracting is practiced.

Waste is meticulously avoided—bits of scrap metal generated during aircraft production are used to make milk cans in the same plant. Covering one square mile, the plant is currently turning out 30 Il-14s a month and eventually will switch to the Electra-like Il-18 turboprop transport, the first of which is almost ready for flight.

Equipment in the Il-12s and Il-14s varies from aircraft to aircraft. This writer rode in an Il-12 which has no seat belts whatsoever. Asking the Russian diplomat seated next to him why there were none, he got the reply: "Why suggest to the traveling public that there



With a decided Vertol look about them Yak-24 Horse helicopters formate over Tushino airport. Gross weight is said to be 35,000 lbs. while maximum payload is 9,000 lbs.

might be an element of danger in flying? The sight of such safety devices might make some passengers nervous!"

Although many do have seat belts, none of Aeroflot's aircraft have "fastened seat belts" or "no smoking" signs.

The stewardesses seem indifferent as to the passengers' welfare but in one aircraft that this writer rode the smell of gasoline during the take-off served as an effective "no smoking" warning!

In other respects, too, Aeroflot's safety standards seem to lag behind those of the West. No instructions are given on the location and use of life-saving equipment. On the long flight across the Baltic this writer asked the stewardess (in French—the only foreign language she spoke) whether such equipment is carried. "Oh, yes," she replied, "we have life jackets and a dinghy in the rear freight compartment!"

Aeroflot stewardesses are mostly in their early thirties. Some are married and are mothers. None, as far as can be determined, are chosen for their looks. Flying personnel are friendly. This writer requested permission to look at the cockpit of the 11-12 in which he was flying. Not only was he allowed to do so but the pilots said: "Any questions?" Photographing the cockpit also was allowed (AMERICAN AVIATION, July 16).

• Flying standard of Aeroflot crews is high. They have to work under somewhat bureaucratic arrangements which seem unnecessary if the Russians have, as they claim, ILS and GCA. No aircraft may depart from an airport if the weather at its destination is bad.

In other words, aircraft may not hold over their destination. They must wait on the ground until they get the word that the weather is okay at the destination. This rule is applied to foreign aircraft as well as to Aeroflot transports.

This rule delayed a Viscount that came to fetch a British aircraft industry mission that was in Moscow at the same time as the military delegations.

It was the first Western group of aircraft industrialists to visit Russia and the British clearly made the most of the opportunity by including in the delegation such top men as: George Edwards, head of Vickers-Armstrongs Aircraft; Sir Arnold Hall, formerly head of Farnborough and now technical director of the Hawker Siddeley Group; and Dr. Russell, chief aircraft designer of Bristol.

The British attitude toward the Russians was markedly different from the American demeanour. The British



Billboards advertise the Russian air show. The streets of Moscow were bedecked with flags for the occasion and on the evening of the show there was a special firework display.

really tried to make friends with their Russian counterparts. They ended up bosom pals yet they did not divulge any secrets in so doing. The U.S. military delegation, on the other hand, maintained a strictly "correct" attitude and stubbornly refused to unbend. Even when introduced to leading Russian air force and aircraft industry men, they showed reluctance to go beyond speaking in platitudes and answering questions in monosyllables. The Russians were left to carry the ball conversation-wise and the going was tough.

The attitude of the U.S. delegation was understandable in that no one quite knew the purpose for which the Russians might have used the visit. Almost everyone in Moscow for the first time feels ill at ease, suspecting that the secret police are watching him. In actual fact during this writer's visit these fears were not borne out—and the Russians scored a big propaganda victory on this count. Security seemed very relaxed and the correspondents were able to send out the hottest of information without any interference by the censor.

"You see," the Russian sitting next to this writer said as the aircraft approached the Latvian coast, "there is no iron curtain. You won't be followed by secret police or end up in a salt mine."

He was right but, nonetheless, it was only a couple of hours after he made this statement that, on a sight-seeing tour of Riga hastily arranged because of a weather delay, we saw soldiers with rifles and bayonets at the ready guarding command posts at the ends of all bridges.

The faces of the people showed very clearly that while there might be

no secret police or salt mines for foreigners these days, the same does not apply to the people of the country.

• The police were on hand outside the Red Army Club where the Russians were entertaining the visiting delegations after the Tushino show. It was very clear that they were not entertaining the press, though.

We tried to follow Gen. Twining through the gate but he said we should wait outside until he had tried to persuade the Russians to let us in. The sight of a dozen U.S. reporters and cameramen hanging around outside the club drew curious looks from Russian passers-by.

Soon the heavens opened and the rain came pouring down. The gates to the club were under a small piece of roofing so we ran toward them for shelter. The police guarding the club thought we were rushing the place and they slammed the gates in our face and started getting quite nasty. The situation was saved by word coming from within that we could enter. Anyone could have got in . . . they let everyone who was hanging around outside go in without looking at documents.

Inside the club the spectacle was impressive. There in the flesh were such names as Molotov, Bulganin, Krushchev, Malenkov, Zhukov—all beaming and doing their best to radiate goodwill. Among the lesser lights was General Budyenny, the famous cavalryman with the upturned moustaches. Lavish supplies of food and drink eventually broke down the somewhat starchy demeanour of many of the visitors. The toasts were answered by most visitors in vodka, in lemonade by some. The most embarrassing moment, perhaps, was when Red China was toasted and the U.S. delegation didn't know whether to get up or stay seated.

• Tupolev was in great form throughout the evening. His executive assistant was an engineer called Nina (no relation to the girl Noel Coward sings about) who spoke excellent English and obviously knew plenty about what was going on in aviation in both the eastern and western worlds.

Both the great designer and his lady assistant were adept at ducking loaded questions but they did it in a jovial manner that didn't stop the conversational ball rolling. Gen. Beletski, operations vp of Aeroflot, had a similarly engaging technique. This writer also worked up his own technique for answering questions. When asked how he liked the Soviet Union, he would reply:

"It's a nice country for living." Some people said he pronounced the last word "leaving."
♦♦♦

TT-1



Temco's new jet wins Navy Wings

The U. S. Navy has selected Temco Aircraft's sleek Model 51 as its first jet primary trainer. Filling its role in a new concept for primary training, the two-place aircraft will give Navy pilots of the future flight training that actually begins in a jet.

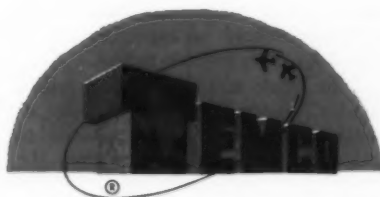
Designed, built and flight-tested by Temco at its own expense, the Model 51 now becomes the Navy's TT-1, after its selection in competitive flight evaluation tests at the Navy's Patuxent River Air Test Center.

The TT-1, basically designed to shorten the number of flying hours for military flight training, combines the flight characteristics of true jet performance with the safety features that student pilots need.

ENGINEERS

Openings in all phases of aircraft design and development; write to Engineering Personnel, Temco Aircraft Corp., Dallas, Texas

DALLAS



AIRCRAFT CORPORATION

Vaudio: A 'Private Line' That's Ready

Melpar's new visual communications system is flexible and can readily be integrated into future ATC common systems.

By HENRY P. STEIER

A technique for improving the precision and speed of communication between ground and air in the present air traffic control system is available.

The system has been developed by Melpar, Inc. and is highly versatile in its present and future system application aspects.

Characteristics of the technique are such that it offers a likely technical prospect for immediate implementation on a crash-program basis to alleviate the worsening conditions in ATC and safety.

Called a Visual Communications System (VCS), its development was started nearly four years ago by a group of Melpar engineers working with VCS's designer Vernon Weihe, who is a consultant to Melpar.

Recurrent in the past, and still with us today, are the basic questions:

- Will planes be required to carry more equipment than the present minimum?
- Will there be areas where there will be no Visual Flight Rules flying?
- Where will planes be required to carry more black boxes?

These matters of operational policy always loom up when new aids are proposed and the form in which new aids appear is contingent upon these decisions.

Coupled to that problem is the "greener pasture" philosophy of something better always around the corner. This imposes the added burden of "built-in" flexibility on designers looking for aids to meet the ever-mounting needs of the present.

Need is Urgent

Recent statements by many ATC experts all attest to the urgency and logic in starting immediate improvement in the communications system, for example:

• **On importance**—"... communication methods between ground and air (are) the vital link in the control system," W. B. Harding, chairman, Aviation Facilities Study Group.

• **On radar as a cure-all**—"As radar speeds up the traffic, everything else will have to keep pace. We are living in a fool's paradise if we think problems of the next ten years can be solved by ordering a few more radars," S. P. Saint, consultant, ANDB.



Typical format of a message transmitted over a "vaudio" bandwidth in Melpar visual communications system. Content here reads, "American Airlines Flight 521, Proceed to Riverdale, Descend to 3,500 feet, Touchdown 42 minutes."

Importance of an improved communications technique and the relationship of this to the "Tacan-troversy" probably means it is the next element in ATC "most likely to succeed" in getting entangled with the civil-military body-politic in aviation.

Work is in progress on a prototype of a Tacan integrated data link. Bell Telephone Laboratories is reported to have developed a data link recently adopted for Navy use, and the Air Force is asking for bids on modification of the Bell system for AF use with its UHF communications gear.

However, Melpar is ready to present its new method of communication to the airlines as a possibility for immediate use. It was designed for maximum flexibility for adaptation to current and future operational needs, and to have the maximum potential for compatibility with future ATC system evolution.

Melpar engineers examined the multitude of communication techniques available and found a wide gap in the communication rates of narrowband systems—voice, teletype, facsimile—and high information rate systems such as entertainment television.

Basic to the early implementation of a higher rate system would be its compatibility with existing air and ground radio equipment. Basic to its future use would be capability of expansion to a higher rate system.

The result was what Weihe calls a "vaudio" system. This is because although a TV-type picture is used to carry communications information, the

system uses audio bandwidths rather than video bandwidths.

• **VCS functions** more like a lantern-slide projection system than a TV system. In its basic form, VCS uses a data-gathering device such as a TV camera tube, or "canned" message sources such as a magnetic drum or tape.

Unlike TV, VCS is self-contained insofar as synchronizing signals are concerned. It has no picture "tear" or vertical and horizontal synchronization problems. No oscillators for horizontal and vertical synchronization are needed. There is no "ghost" problem since the multi-path time is less than one "on-off" picture element.

Voltages to sweep the electron beam in camera tube and cathode ray indicator tubes on the ground and in the air are produced by vertical and horizontal generators. Sweep voltages modulate a subcarrier oscillator. Output of the subcarrier oscillator is combined with the output of a video amplifier. The resulting signal is used to modulate the signal of any conventional communication link—ground wire line or HF, VHF or UHF transmitters.

• **At the receiving end** of a communication link, the output of the conventional radio receiver is fed to circuits that separate the vaudio signal from the subcarrier signal. The subcarrier signal containing sweep information is demodulated, and the horizontal and vertical sweep signals obtained are separated and used to deflect the beam of a bright storage display cathode ray tube.

(Continued on Page 40)

Comparison of Available Data Transfer Techniques

System	Message Capacity	Suitability For Pilot Operation	Language Limitations	Spectrum Required	Error Susceptibility	Scope	Status
Radio Telephone	200 words a minute	Attention to calls needed	Foreign language problem No pictorial capability	3 kc	Misunderstandings	Speech only	Highly developed
Morse Code	20-30 words a minute	Extra crew member needed	Adaptable to international codes	Less than 1 kc	Errors possible	Coded text only	Fully developed
Teleprinter	Approx. 65 words a minute	Attention and typewriting skill needed	Adaptable to international code	Six-60 WPM circuits, each 5000 cycle sideband of r-f system	Remote	Letters and numbers only	In development
Facsimile (page)	2500 words minute	Attention during composition of message	Codes and pictures can be used	Up to 25 kc for high speed	None	Written, printed or pictorial	In development Ground equipment fully developed
Facsimile (tape)	309 characters a minute	No skill or attention needed	Adaptable to international codes	2.5 kc		Written, printed or symbols	Ground equipment fully developed
Beechnut (British)	7-13 seconds for one message	Attention needed	Adaptable to language differences	3 kc	Self-checking	Limited to prepared messages	World War II development
Voflag (RCA)	6 seconds per message	Attention needed	Adaptable to language differences	3 kc	(Not known)	Limited to prepared messages	World War II development
CAA Visual	Instantaneous	Attention needed	Adaptable to language differences	3 kc	(Not known)	Limited to prepared messages	Proposed only
Television	Instantaneous but messages must be retained till read	Immediate attention	Adaptable to language differences	5-10 mc	Not possible	Written, printed or pictorial	Not bright enough for cockpit use
VCS (Melpar)	Similar to TV but image retained	Limited attention	Adaptable to language differences	3 to 5 kc	Not possible	Same as facsimile and TV	Techniques developed. Drum storage unit needs development

Four classes of visual data transfer techniques. Facsimile of the page type is being developed by the TelAutograph Corp. The system uses foil-coated paper which is scribed by a moving pen. The result is a silhouette that may be projected on a screen. Beechnut and Voflag use rotating drums with markings. CAA Visual uses a circle of lights corresponding to altitude and fixed messages. Facsimile, Beechnut and Voflag are inherently slow because of the moving-mass inertia of mechanical parts.



SUPERSONIC SHADOW

Tomorrow's aircraft are casting their shadows before them. Details of their performance are incredible. Yet their most dramatic asset is still the fact that a human pilot will be at the controls. For there is no mechanism that possesses man's power of judgment . . . his ability to capitalize on opportunity. At North American—home of the U. S. Air Force F-100 SUPER SABRE, the free world's first operational supersonic fighter, and the Navy FJ-4 FURY—this is the order of the day: to make tomorrow's planes habitable by man, while they operate at speeds and altitudes which otherwise would be beyond his physical limitations.

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The shape of things to come in long range missiles looms ever clearer at North American. More than ten years ago, North American engineers started work in an almost unexplored technological world. This was the birth of the U. S. Air Force's SM-64 NAVAHO Intercontinental Missile. Today — though security restrictions prohibit any details — we can tell you that the automatically controlled NAVAHO is playing a vital role in the Air Force's program of missile development, so essential to our nation's security.

North American Aviation, Inc., Los Angeles, Downey, Canoga Park, Fresno, Calif.; Columbus, Ohio

AMERICAN AVIATION, INC.

Engineers: write for details regarding challenging positions now open.



JULY 30, 1956

(Continued From Page 36)

The tube would be mounted in the cockpit of a plane.

What appears on the storage tube would be a picture containing letters, numbers, symbols or simple line maps. The bandwidth needed to do the job might range from 3 kilocycles to 12 kilocycles, depending upon the requirement of the user.

Communication rates of 500 to 2,000 words per minute can be achieved. Yet coaxial or microwave circuits are not needed. This is very important to early implementation since existing 3-kc or 5-kc lines are already installed and their rental cost is low. Cost of a 3-kc land line per mile per month is about \$3.50, and a 5-kc line costs about \$6.80. Wide-band lines cost many times more.

Major Melpar emphasis has been concentrated in the audio bandwidth range of 3.0 to 12 kc, although up to 100 kc could be used for applications requiring a higher rate.

At 3-kc there are $2\frac{1}{2}$ pictures per second and 48 scanning lines per display. With this lower picture frame rate and fewer lines than standard TV, the system gives a communication rate of about 900 words per minute. Upping the frame rate by increasing the bandwidth to 4.5 kc cycles increases the WPM rate to 1200. These figures are based on a frame carrying 20 characters.

Using the new system it would be unnecessary for the operator to monitor the receiver at the moment of transmission. Weihe visualizes a system in which one ATCSS (Air Traffic Control Signalling System) box of $\frac{1}{2}$ to $\frac{3}{4}$ ATR size would serve both HF and VHF, or VHF and UHF transmitters and airborne receivers and would have a number of different modes of operation. A "private line" feature would be an addressing system similar to that used in SELCAL.

The modes would permit a different number of pictures per second and perhaps a different number of lines per inch in the picture to serve ATC, weather, position reporting and dispatch function. Choice of mode could be made to best meet the operating requirements of different services and available circuit bandwidth.

• To address specific aircraft, tone generating and receiving circuits would be used. Melpar's addressing work thus far has been with a 50 millisecond version of SELCAL. When the correct coded tone is received by a specific aircraft, a picture frame is permitted to pass through its VCS system.

The frame appears on a tube like the Hughes Aircraft Co.'s Memotron. VCS transmits only a single frame at a time in a "burst", and the Memotron storage tube enables picture information to be preserved for periods ranging from

seconds to many hours.

The picture remains available until it is erased, or until after a predetermined time, it decays.

The system was planned to permit use of existing VHF or UHF transmitter and airborne receivers. At this time the bandwidth of VHF and UHF airborne receivers is about 9 kc.

Of this bandwidth only 4-kc are needed for voice communication. Therefore a bandwidth of 5-kc is available for visual communications. This permits a VCS picture-frame time of under 0.2 seconds. If capability of transmission to 15 aircraft in not more than 5 seconds on a single radio frequency channel is desired this leaves 0.333 seconds for each transmission.

The communication sequence that might be used in this time is:

1. Ground-to-air selective calling—80 milliseconds.
2. Air-to-ground safety checkback approximately coincident with selective calling.
3. Ground-to-air request for acknowledgement—20 milliseconds.
4. Air-to-ground acknowledgement—20 milliseconds.
5. Ground-controlled erasure of previous message (if desired)—13 milliseconds.
6. Ground-to-air transmission of visual message—200 milliseconds.

All this could be done through existing receivers on aircraft. Many installations already have circuits and outlet provisions waiting for adoption of an ATCSS system which shares the bandwidth built into the voice equipment.

In a future system where radar-derived information is used by controllers, that information could be flashed to a plane on its "private line." The VCS system could be coupled to the aircraft's instruments for flashing back verification, or a row of buttons alongside the picture frame could be used by the pilot to verify or acknowledge a message on a message-line basis. A button would

be located at each line of information.

A typical message format might include a flight number in the first line, and clearance information in two other lines.

Fail-Safe Operation

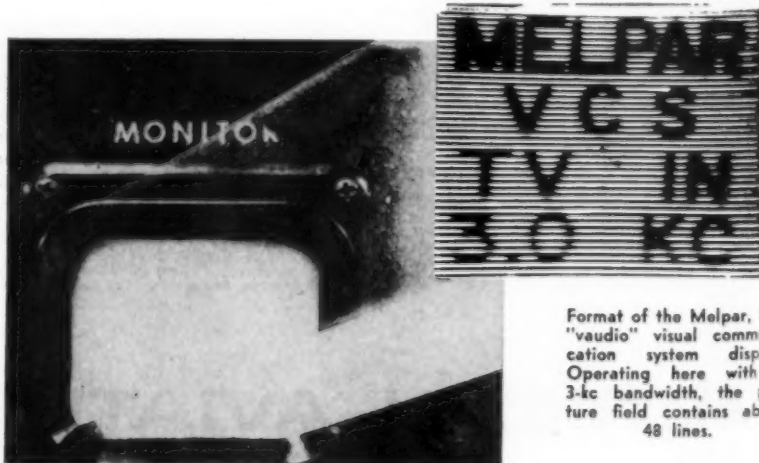
• **Inherently VCS is fail-safe.** Pictures do not lie. The system with 48 lines has shown itself to have sufficient definition to carry four lines of information with easily read clarity, according to Weihe. VCS is not sensitive to "noise," that is, extraneous signals such as ignition interference, etc.

Basically the system was designed with a minimum of complexity far removed from that of ordinary TV, and according to Weihe the only technical problems are the display tube limitations. These are rapidly being overcome. The tube size problem will soon be overcome by expected development of a Hughes 3-inch Memotron. The tube gives a bright display easily seen in a cockpit during peak sunlight conditions.

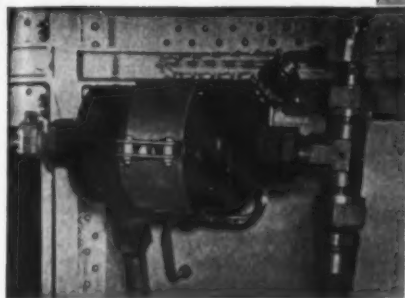
• **On the operational side** of the picture, Weihe believes "limited data transfer and display to improve coordination between controllers has first priority." This is a one-agency requirement and should permit rapid implementation.

Since the air-ground link involves all operators and agencies, and involves several models of airborne equipment, Weihe believes the "time scale is therefore longer."

At this time Aeronautical Radio Inc.'s Airlines Electronics Engineering Committee has established a subcommittee on ATCSS to examine operational policy. Whether ARINC can come up with a characteristic for visual data transfer equipment depends upon what is happening in the military area of the common system deliberations. But in any event the airlines operational requirements are due for investigation when ARINC's new subcommittee begins its meetings this month. ♦♦♦



Format of the Melpar, inc. "vaudio" visual communication system display. Operating here with a 3-kc bandwidth, the picture field contains about 48 lines.



Point of no Return



When a USAF TM-61 Martin Matador leaps from its launcher, it has passed its point of no return. Its mission calls for a one-way trip to the target. The Matador must function perfectly if its mission is to be accomplished. There is no turning back for repairs.

Fuel flow plays a vital part in sending the Matador to its objective. At the speed it travels even a momentary interruption could cause serious deviation in flight characteristics. Martin needed a filter to remove foreign material from the fuel. A filter that would function perfectly, yet be expendable, light in weight, resistant to corrosion. The filter had to have a minimum shelf life of two years. They came to Purolator for a special design.

The Purolator filter designed for use in the Matador filters down to 5-10 microns at a flow rate of 18 GPM. It can be connected directly to auxiliary fuel tanks outside the missile so that fuel on board is not consumed during pre-flight calibration operations. Its construction is resistant to corrosion, has the required shelf life, yet it is lightweight and expendable. A perfect example of Purolator's ability to engineer and manufacture filters for special needs . . . no matter how stringent the requirements are.

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Boeing's Compressed-air Jet Starter



Improved version of jet aircraft compressed-air starter unit powered by its 502-11B gas turbine-driven centrifugal compressor is now in production for the Air Force by Boeing Airplane Co. Model 502-11B is rated at 210 air horsepower, a 70 hp increase over former Model 502-7D, and uses a single-stage compressor to replace twin-stage used in earlier design. Castings in basic engine have been reduced from 18 to seven.

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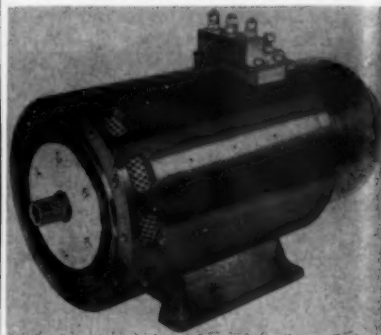


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Circle No. 9 on Reader Service Card.

AIRCRAFT GENERATOR



A 160-kva generator, said to be the highest rated machine ever designed for aircraft, has been developed by Jack & Heintz, Inc. at the request of the Naval Bureau of Aeronautics.

This generator was designed for ac requirements of nuclear-powered aircraft, but is suitable for present multi-engined planes, either as a ground power supply or an airborne unit.

Designated Model Gf80, the unit weighs approximately 260 lbs., measures 22" long and 11" in diameter. Literature is available.

Circle No. 162 on Reader Service Card.

SCREWJACK ACTUATORS



Southwestern Industries, Inc., is producing a series of lightweight screwjacks for aircraft and missiles, suitable for actuation of wing and cowl flaps, vent doors, drag brakes and canopies.

These actuators incorporate rotary input with double-ended splined shaft. This permits use of several units in series, linked by flexible couplings.

Unit illustrated has a stroke of 3.1", maximum operating compression load of 2,500 lbs. and tension load of 1,200 lbs.

Circle No. 159 on Reader Service Card.

SLIP RING ASSEMBLY

Avco Manufacturing Corp. has developed a new type slip ring assembly designed to obtain accurate data on stresses of rotating parts while in operation.

The assembly may be built to requirements. Unit shown weighs 6 lbs., measures 6" in diameter and is less than

Circle No. 10 on Reader Service Card. →



THE STORY BEHIND THE STORY

WITHIN SECONDS after locating an invading jet, this Navy fighter pilot in his Chance Vought F7U Cutlass can shoot it out of the air. Good marksman-ship plus a good missile—the Navy's Sparrow I.

LIGHT AND COMPACT, Sparrow I is carried under the interceptor's wings—can be launched singly or in rapid succession. Warhead is powerful enough to destroy largest known bomber.

AIR-TO-AIR MISSILE JOINS FLEET

Sparrow I assigned to Carrier Operations

IN ACTION, Navy pilot locates and tracks target with radar in cockpit. With plane aimed at target, pilot launches rocket-powered Sparrow I which rides a radar beam at more than 1500 miles an hour to intercept the target, even under evasive action. Against planes and other missiles, Sparrow I has proved its effectiveness.



SPARROW I weapon system, developed and produced by Sperry for the Navy's Bureau of Aeronautics, is an important combat-ready weapon in the nation's arsenal for defense. In addition to Sparrow I, Sperry is currently engaged in several other missile projects involving all types of these new weapons so vital to deterring aggression.

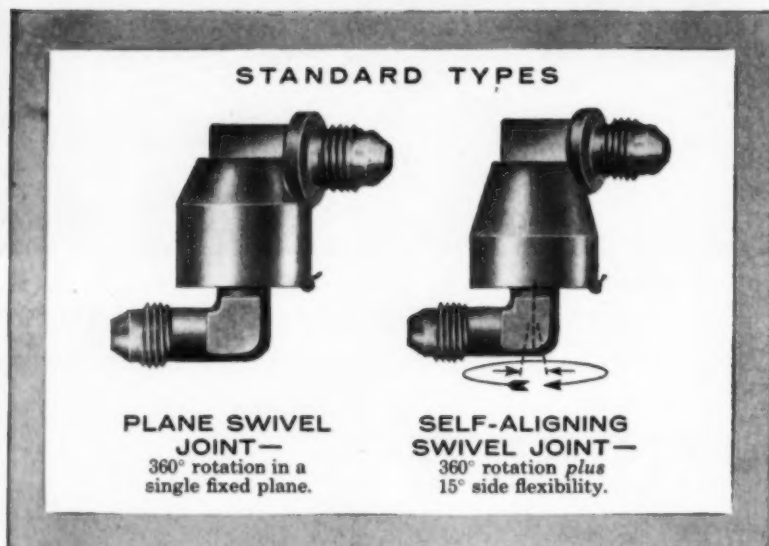
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—gives details on Barco swivel joints and their application to many types of flexible assemblies.

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SPECIAL DESIGNS



WING FOLD HYDRAULIC ASSEMBLY



DOUBLE HYDRAULIC JOINT ON MILITARY TANKS



TRUNNION JOINT LANDING STRUT ASSEMBLY



AIRCRAFT BRAKE LINE JOINT

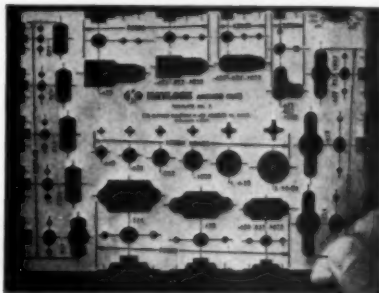


NEW PRODUCTS

6" long. According to the manufacturer, it will pick off readings on seven circuits (14 rings), operate up to 5,000 rpm and transmit any signal or change of signal whether through thermocouples or strain gauges.

Circle No. 134 on Reader Service Card.

DRAFTING TEMPLATE



The Kaynar Co. offers designers a new drafting template covering standard anchor nuts conforming to AN362 and AN366, as well as single-lug, corner-type and floating anchor nut styles. It is available free. Template No. 1 is for miniature and hex nuts, template No. 2 for standard fixed and floating nuts.

Kaynar has also introduced a new line of clinch nuts and a floating anchor nut. The clinch nuts, designated K7000, combine flush mounting and self-locking features. They are suitable for electronic applications, such as terminals, switches and circuit breakers, and may also be installed in fiber-glass printed circuits, steel, aluminum or copper. Available in sizes 4-40 through 1/4"-28.

Kaylock F1934 is a deep-counter-bore, two-lug floating anchor nut designed chiefly for use around access doors or openings that require constant grip-length screws for different thicknesses of materials. It makes unnecessary the use of shims.

Circle No. 138 on Reader Service Card.

X-BAND TEST SET



Marconi Instruments is producing an X-band test set for maintenance of airborne radar equipment. Model 890/2 measures transmitter and local oscillator frequencies, transmitter power, system, VSWR, receiver noise level, IF response and AFC discriminator response. Also,

AMERICAN AVIATION

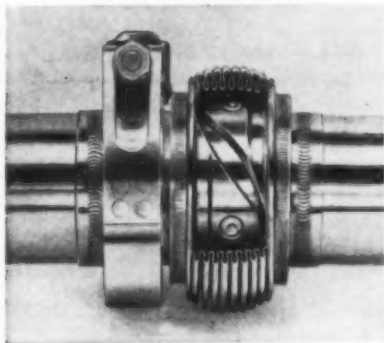
NEW PRODUCTS

it displays the magnetron frequency spectrum.

The company says it is suitable for checking Bendix RDR-1 radar and similar systems.

Circle No. 152 on Reader Service Card.

UNIVERSAL JOINT



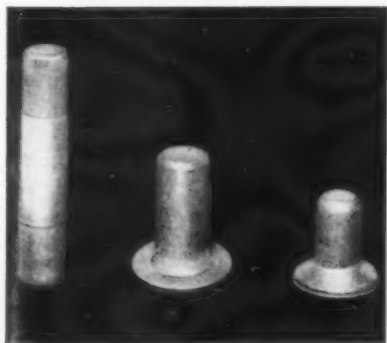
Marman Products Co., Inc., has developed a universal joint designed to meet the severe flexure and vibration that occur in supersonic aircraft ducting systems.

Designated MB11, the joint is capable of handling a high volume of gases at temperatures ranging from -300°F to 800°F . Pressure drop is 8% of the velocity pressure at 3° deflection and 11% at 7° . Maximum angularity of the joint is 10° in any direction.

The joint is designed to prevent the transmission of either torque or end load into the bellows. It weighs .92 lb. in the 2" size and 1.6 lbs. in the 3" size.

Circle No. 156 on Reader Service Card.

SELF-SEALING RIVETS

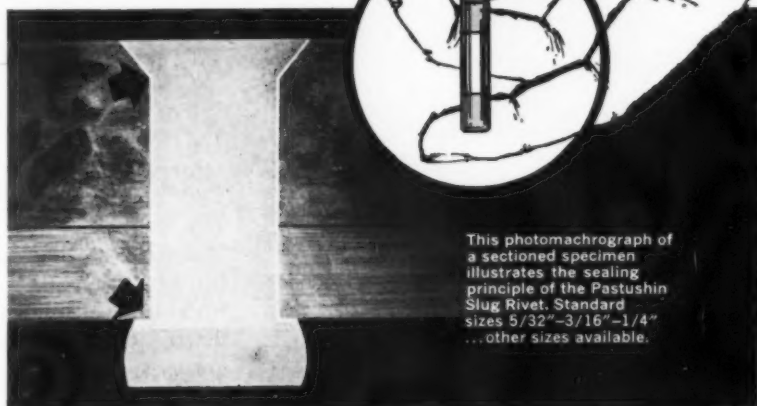


Pastushin Industries, Inc. reports volume production of a series of rivet fasteners that automatically seal themselves against fluid or air leaks without caulking or rubber sealing agents.

Called "Fluid-Tight," they are intended for use in integral fuel tanks, external tanks, pressurized aircraft sections, flying boat hulls, pontoons and other structures where loss of fluid or pressure is critical.

Series includes a slug-type (left)

Here is the versatile Pastushin Slug Rivet that gives absolute Fluid-Tight Construction



This photomachograph of a sectioned specimen illustrates the sealing principle of the Pastushin Slug Rivet. Standard sizes $5/32"-3/16"-1/4"$...other sizes available.

The Pastushin fluid-tight slug rivet seals automatically. The exclusive fluid-tight seal is accomplished by the extrusion, or flow, of the .004 wall 1100 aluminum alloy sleeve into possible leak areas of the hole when the rivet is expanded during driving. Positive sealing is accomplished without the addition of foreign sealing agents.

Because Pastushin Slug Rivets do not have preformed heads, uniform flow of rivet shank material in the flush head and upset end is assured during the driving process.



PASTUSHIN REPLACEMENT RIVETS: For production or field maintenance, three types are available, Jacket, Washered, and Washer-Jacketed. Like the slug rivet, they are fluid-tight, have full rivet strength and are easy to install with conventional tools and methods.

Write for Slug Rivet catalog PI-5 and No. PA-3 for details on the Pastushin repair kit.



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FASTER FARTHER HIGHER

The development of guided missiles of every type is becoming one of the most competitive areas in our world today . . . for supremacy in this field can well determine peace for many years. The race is now for greater speed, higher altitude, longer range, more sensitive control.

The strength of Western defense lies to a great extent in the development for the Armed Forces of these new weapons systems suited to the supersonic age. The once deadly cannon, machine gun and rocket are being superseded by complex weapons of great ingenuity.

Canadair has long had a prominent role in Canada's guided missile program, applying the knowledge acquired in years of experience in advanced aircraft systems engineering . . . and Canadair's research, engineering and manufacturing resources are constantly making further important contributions to projects in this field.



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for use on automatic machines, which seals by extrusion of a soft (.004 inch) metal sleeve without caulking or rubber sealing as the jacket completely fills a cleanly-drilled hole in new production work; a replacement rivet (center) in which the soft (.007 inch) jacket fills out a reworked hole; a washered rivet (right) having a .010-inch underhead thickness, for use where sealing is required under the heat of the rivet only and where sealing compounds are used between the attaching skin, and a combined washer-and-jacket rivet.

They may be used with automatic machines or normal hand operating tools. Standard or special order sizes are available for immediate delivery.

Circle No. 153 on Reader Service Card.

TEST STAND



A test stand for aircraft hydraulic pump and motor systems that performs the same course of tests formerly requiring two different machines has been developed by Greer Hydraulics, Inc.

Designated Model HPM50-2H, the Greer unit measures the performance of variable displacement pumps and motors up to 75 hp; hydraulic flows from 1.4 to 41 gpm and pressures to 3,500 psi. Higher horsepower tests can be accomplished by the introduction of a hydraulic feedback system.

Circle No. 157 on Reader Service Card.

Product Briefs

• Regulator Engineering and Development Co. has developed a mobile test load bank, Type 30-1, for testing 400-cycle alternators.

Circle No. 169 on Reader Service Card.

• BLC Porous Materials Co. offers a porous metal sheet trade-named Varapert to cover all applications of boundary layer control for high-lift, drag reduction or transpiration cooling. Varapert is said to be based on a new concept in forming sheets in which permeability is controlled by the hole size and/or the spacing pattern.

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People

MANUFACTURING

T. V. Purvin named president of the Hupp Aviation Division of the Hupp Corp.

Roland J. Pagen, vp and treasurer of Northrop Aircraft, retires July 31; Charles C. Cilley succeeds him as treasurer.

Robert M. Loebelson, military editor for AMERICAN AVIATION, has resigned to join Hill & Knowlton, assigned to the Aircraft Industries Assn. account in Washington.

Dan W. Burns appointed vp and gen. mgr., Hufford Machine Works, Inc.



Col. C. Glen Williamson (USAF, ret.) named an Associate of Sherman Fairchild & Associates, Inc.

T. Benson Hoy joined Lynn-Western, Inc., as vp and editorial director.

Harry L. Owens appointed chief engineer for Texas Instruments, Inc.; Cecil P. Dotson named mgr. of manufacturing for the semiconductor-components division.

Philip A. Allen, Jr., appointed mgr. of Aeronautic Export Corp.

Alfred Walker made director of advertising and public relations, Logistics Research, Inc.

William H. Kafferlin named mgr. of new aircraft engine components section, Aero Supply Mfg. Co., Inc.

Harry R. Wege appointed mgr. missile and surface radar dept., Radio Corp. of America.

Carl J. Knorr elected vp and gen. sales mgr. of Remington Rand Univac Div. of Sperry Rand Corp.

Joseph R. Pernice appointed managing director of Collins Radio Co. of England, Ltd.

Earl D. Hilburn becomes west coast mgr. for Link Aviation, Inc.; W. C. Hammond-Adler named European district mgr.

AIRLINE

R. W. Ryan appointed exec. vp and dir., R. B. Phillips appointed vp-operations, and H. B. Renwick raised to vp, Canadian Pacific Airlines.

New Facilities and Property Department of United Air Lines headed by S. V. Hall, asst. vp-facilities; D. C. Meehan named gen. mgr. of facilities and property; R. S. Twist continues as director of property.

James G. Ingram appointed asst. superintendent of flying operations, Western Division, American Airlines.



Frank J. Eberle rejoins Air Express International as regional vp-Southern Region.

Capt. James N. Weir appointed chief of flight operations for British Overseas Airways Corp.

Capt. Philip Walter Kelshall named acting asst. gen. mgr. (technical) for British West Indian Airways.

Stan Gluek named to San Francisco exec. post in the Pacific-Alaska division of Pan American World Airways.

M. Gaston Dieu, Sabena Belgian World Airlines mgr. in Africa, named asst. to the president.

GOVERNMENT-MILITARY

Wiley R. Wright named chief of the new Industry and Interagency Liaison Staff, Office of Aviation Safety, Civil Aeronautics Administration.

Brig. Gen. John H. Ives named chief of staff of the Continental Air Command, succeeding Brig. Gen. Lawrence M. Guyer, recently named chief of staff of the UN Armistice Commission in Korea.

Maj. Gen. Kingston E. Tibbetts will be first director of the new Plans and Programming Directorate at Headquarters, Air Materiel Command.

Brig. Gen. John H. Henebry (USAF Reserve) reappointed chairman of the Air Staff Committee on AF Reserve Policy for three-year term.

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*H. Mansfield Horner, United Aircraft Corp. Chairman of the board, E. Hartford, Conn. (30 yrs.)

N. S. Coonrod, American Airlines. Foreman, maintenance, Ft. Worth, Tex.

J. F. Nutting, American Airlines. Flight dispatcher, La Guardia Field.

G. W. Rule, American Airlines. Supervisor, administrative services, Newark, N.J.

L. G. Russell, American Airlines. Sr. mechanic, maintenance, Ft. Worth, Tex.

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Chromium	4.000	63.0
Copper	6.000	2.5
Germanium	4.000	—
Gold	2.000	6.2
Indium	4.000	2.5
Iron	3.000	10.2
Lead	5.000	3.8
Nickel	5.000	5.1
Nickel (Black)	5.000	—
Platinum	3.000	17.5
Rhodium	3.000	70.0
Silver	1.250	5.1
Tin	5.000	2.5
Zinc	3.000	3.8

* On an area equal to the pad electrode used.

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West Coast Talk . . . By Fred S. Hunter

- New target date for Hughes' flying boat?
- Lockheed to step up engine test program.

WE WERE MULLING through an old file the other day and came upon a story we had written 10 years ago. It described how a crew of house-movers had moved Howard Hughes' big H-4 flying boat from Culver City to Long Beach harbor—28 miles—with no more fuss than moving a six-room house. They simply hoisted the sections of the plane—including the 220-foot long hull—on multiple dollies and set off down the highway at the regulation 2 mph. But what struck our 1956 attention in this 1946 story was a sentence saying: "January 1, 1947 is the date at which Hughes Aircraft Co. is shooting for the initial flight of the giant craft." Made us wonder if Howard Hughes might now be shooting for January 1, 1957.



Hunter

Lockheed soon will be stepping up the engine test program on the turboprop Electra. It's been getting in some licks on a military T56 installed in its Constellation test aircraft, No. 1961, but this is now being replaced by a commercial-type 501-D16 engine recently delivered to Lockheed by Allison.

The D16 is an interim version and it's installed in a C-130 nacelle in No. 1961, but it incorporates most of the changes differentiating the commercial 501-D13 from the military T56 and will give Lockheed the opportunity to accumulate important advance power plant data. Allison's plans call for a D13 production-type engine to be available for Lockheed for installation in an Electra nacelle for flight test in 1961 by March, 1957.

New runways at Edwards Air Force Base provide the Air Force Flight Test Center with far and away the best facilities in the U.S. for recovery of disabled aircraft. A B-52 can land on the new flight line with no brakes and maintain good steerage until coming to a natural stop. This is without aid of a drag shoot. This is due to the smoothness with which an aircraft at high speed can make the transition from the 15,000-foot concrete runway to the lake bed.

A one-depot support and supply system has been worked out by the San Antonio Air Materiel Area and Convair for better control of material for the F-102 program. San Antonio becomes the weapons systems support center for the whole works and a single point for all F-102 requisitions. System went into operation with the first F-102s put into service at George Air Force Base.

Douglas Aircraft's Tulsa division is building RB-66Cs under subcontract from Douglas Aircraft's Long Beach division, which is a good way to keep a project in the family. Differences between the Tulsa planes and the B/RB-66Bs built at Long Beach is primarily in the heavy electronics installations in the Cs. The B/RB-66, it might be added, appears to have completely redeemed itself after a shaky start. It gets off the deck fast, flies high fast and otherwise fulfills the mission of an attack bomber.

After Southern California Aircraft Corp. fixed up a couple of PBVs into combination passenger-cargo aircraft for AF helicopters for a contract service AF operates between Australia and New Guinea, it flew the amphibians from its Ontario shops to San Diego harbor, where it converted the planes into flying boats.

Six pylon stations give North American's F-100 quite a load-carrying potential . . . Lockheed's missile systems division expects to move about 300 employees to Palo Alto in the first two weeks of September when it will have occupancy on two research buildings . . . Convair's B-58 is ticketed to fly in October . . . General Electric is guaranteeing performance of its commercial J79 engine under worst operating conditions.

Some congressmen seem to think all the Air Force has to do to build up its B-52 fleet is tell Boeing to increase its rate of production and build more airplanes. Such problems as flight crews, ground crews, facilities and all the items of supply and support are passed over lightly.

Airlines List Top Executives' Salaries

The following carriers have filed with CAB Schedule E reports listing the 1955 salaries and other compensation of officers and directors:

Hawaiian Airlines, Ltd.—Arthur D. Lewis, pres. & dir., \$23,981 salary (entered office 2/16/55), \$1,726 bonus & indirect compensation; Brian Cooke, v.p.-treas., \$13,733 salary (up \$3,800), \$621 bonus & indir.; Lionel D. Machado, v.p.-oper., salary \$16,339 (entered office 5/26/55), \$660 bonus & indir.; Jack C. Tobin, v.p.-sales, \$4,250 salary (entered office 10/1/55), \$263 bonus & indir.; George K. Tanabe, asst. treas. & asst. secy., \$9,359 salary (up \$1,359), no bonus & indir.; John S. Push, secy., \$7,883 salary (down \$2,617), no bonus & indir.; Stanley C. Kennedy, chm. bd., \$7,000 salary (down \$17,525), \$260 bonus & indir.; Ford Studebaker, exec. v.p. & dir., \$12,325 salary (down \$5,175), \$100 bonus & indir.; David Watson, v.p., treas. & dir., \$17,856 salary (up \$2,356), \$280 bonus & indir.; M. B. Carson, dir., no salary, \$200 bonus & indir.; James Greenwell, dir., no salary, \$1,430 bonus & indir.; Thomas Guard, dir., no salary, \$280 bonus & indir.; Dudley C. Lewis, dir., no salary, \$280 bonus & indir.; P. K. McLean, dir., no salary, \$260 bonus & indir.; J. E. Russell, dir., no salary, \$220 bonus & indir.; W. C. Tsukiyama, dir., no salary, \$220 bonus & indir.; George Vicars, dir., no salary, \$300 bonus & indir.; R. Von Tempesky, dir., no salary, \$200 bonus & indir.; H. W. B. White, dir., no salary, \$1,420 bonus & indir.; G. P. Wilcox, dir., no salary, \$80 bonus & indir.; George S. Wong, dir., no salary, \$260 bonus & indir.

Persons other than directors, officers and employees paid more than \$10,000 for personal services were McKinney & Co., Los Angeles, Calif., organizational study, \$13,300.

Trans-Texas Airways—R. E. McKaughan, pres. & dir., \$25,800 salary, \$60 bonus & indir.; H. E. Erdmann, v.p.-dir., \$13,200 salary (up \$200), \$60 bonus & indir.; L. J. Eichner, v.p., \$11,600 salary (up \$1,066.64), no bonus & indir.; M. L. Muse, secy.-treas., \$10,600 salary (up \$800), \$60 bonus & indir.; J. K. Ayer, exec. asst. to pres., dir., \$7,600 salary (up \$2,800), \$40 bonus & indir.; W. C. Leatherwood, dir. of purchases, \$4, salary \$7,600 (entered office 4/28/55), \$60 bonus & indir.; J. M. Brooks, dir., no salary, \$60 bonus & indir.

Persons other than directors, officers and employees paid more than \$10,000 for personal services were Clark, Coon, Holt & Reid, Dallas, Tex., legal \$42,400.

Piedmont Airlines—T. H. Davis, pres., treas., dir., \$16,500 salary, no bonus & indir.; R. D. Hager, v.p.-traffic, asst. to pres., dir., \$11,520 salary, no bonus & indir.; R. S. Northington, v.p.-fixed base div., dir., \$8,225 salary (up \$175), no bonus & indir.; H. E. Saunders, v.p.-oper., \$14,400 salary (up \$100), no bonus & indir.; M. F. Fare, secy., dir., \$8,500 salary (up \$350), no bonus & indir.; G. E. Anderson, dir., no salary, \$50 bonus & indir.; E. L. Davis, Jr., dir., no salary, \$25 bonus & indir.; W. Frank Dowd, dir., no salary, \$50 bonus & indir.; C. E. Norfleet, dir., no salary, \$50 bonus & indir.

Persons other than directors, officers and employees paid more than \$10,000 for personal services were Kilpatrick, Ballard & Beasley, Washington, D. C., legal, \$14,126.57.

Northern Consolidated Airlines, Inc.—Victor E. Davis, secy., \$9,950 salary (up \$350), \$1,000 bonus & indir.; Marie A. Peterson, asst. secy., \$1,892 salary (up \$92), no bonus & indir.; Raymond I. Peterson, pres., gen. mgr. & dir., \$18,000 salary, no bonus & indir.; Stuart B. Fitzhugh, treas., comptroller & dir., \$12,425 salary (down \$1,450), \$1,000 bonus & indir.; Robert J. Stevenson, v.p. & dir., \$2,430 salary (down \$6,443), no bonus & indir.; John A. Walatha, dir., \$12,216 fee, \$1,000 bonus & indir.

Persons other than directors, officers and employees paid more than \$10,000 for personal services were: Theodore Seamon, legal, \$14,737.

Resort Airlines, Inc.—Clinton Davidson, Jr., chm. bd., \$15,000 salary, no bonus & indir.; Harold L. Graham, Jr., pres., \$15,000 salary, \$13,610 bonus & indir.; Douglas P. Larsen, v.p.-oper., \$3,091 salary, \$11,110 bonus & indir.; James F. Murray, v.p. & comp., \$6,748 salary, \$11,110 bonus & indir.; Van Buren Nixon, v.p.-maint., \$8,046 salary, \$11,110 bonus & indir.; John P. Simpson, secy.-treas., \$6,000 salary, no bonus & indir.; Richard A. Miller, treas., \$5,460 (down \$6,540), no bonus & indir.; Harry B. Taylor, compt., \$2,989 salary, no bonus & indir.

(Continued on Page 73)



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ON OPERATION DEEP FREEZE, a Sikorsky helicopter flies over the Antarctic volcano Mount Erebus. The commanding officer of the Navy Task Force praised the performance of the four HO4S helicopters on Oper-

ation Deep Freeze. Typical of their accomplishments, one helicopter in a 24-hour period ferried 200 men to the shore base from ships five miles away. No other transportation was possible because of breaking ice.

AROUND THE WORLD WITH SIKORSKY HELICOPTERS



S-55s FOR SOUTH AFRICA—The South African Air Force has bought two Sikorsky S-55s. These aircraft, with a third now on order, will be used for rescue and other emergency duties. Above, a pilot officer checks controls before takeoff from the Sikorsky plant on a training flight. S-55 type helicopters serve with all armed forces of the U. S. and those of many free nations.



FOR OIL WORK OFFSHORE—Among oil companies using Sikorsky helicopters to speed drilling offshore in the Gulf of Mexico is The California Company. The company recently purchased two new S-55s to join two already flying for the firm off Louisiana. In Gulf operations the S-55s are equipped with flotation gear. Above, one of them flies past Sikorsky's new plant control tower.



HELICOPTER HISTORY



FIRST MARINE CORPS HELICOPTER

In November, 1947, at Quantico, Va., this Sikorsky HO3S became the U. S. Marine Corps' first helicopter. Progressing from such early uses as air-sea rescue, being demonstrated in this photo, the Marine Corps has created new assault tactics built around the mobility of the helicopter and its unique ability to transport men and equipment anywhere. Today, huge HR2S helicopters promise the large scale airlift capability essential for vertical envelopment.

JOINING THE MARINES—This huge twin-engined Sikorsky HR2S assault helicopter topped performance expectations on its recent flight from Sikorsky's Stratford plant to the Naval Air Test Center, Patuxent River, Md. It was the first production delivery flight. This helicopter, known as the H-37 in the Army version and as the S-56 in the commercial version, has retractable landing gear and two Pratt & Whitney R-2800 engines. Its speed, range, and payload capabilities reflect marked advances in the art of helicopter design and production.



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Ambrose Revives an Old Veteran



First of a fleet of eighteen 1948-1950 vintage Northrop C-125D Raider tri-motors is now being modified by Frank Ambrose Aviation Co., Miami, to serve as lumber carrier from an improvised landing strip on an 8,500-ft. high Mexican mountain.

Major rework involves installation of 1,350-hp right R1820-56 engines to replace the 1,200-hp-99 series that were standard on C-125s. Increased power will enable the Northrop tri-motor to haul 10,000 pounds of lumber in one direction and 14,000 pounds of machinery, fuel oil and other supplies back to the mills.

Program is being handled by Ambrose for Triplay y Maderas, lumber mill operators of Durango, Mexico. Company officials expect the air-haul will take only 30 minutes compared to several days now required by truck. The latter entails travel over dirt roads for more than 350 miles on a route that becomes almost impassable during the rainy season.

Besides the engine change, Ambrose is completing a number of other modifications to the C-125Ds. These include:

- Removal of thermal de-icing system heaters and ducts, excess wiring and oxygen equipment.

- Sealing of wing leading edge intake ducts and exhaust openings at wing tips.

Weight savings resulting from these changes, plus the 450 hp increase, have raised the controllability and cruising speed by 25 mph and improved overall performance remarkably, Ambrose officials say.

For example, empty weight has been cut to 25,000 pounds and is expected to go as low as 24,000. Gross weight at which the trimotor will climb on any two engines (at sea level) is estimated at 43,500 lbs., giving a useful operating load of 18,500 lbs.

Estimated ceiling at 38,000 lbs. gross is 19,000 ft. This falls to 11,000 ft.

with one engine out.

Initially the C-125 was well on its way toward CAA certification under CAR Part 3 at Northrop when the civil market for the tri-motor waned in 1950. Some 55 hours of flight testing had been completed and only stall tests and engine-out takeoff tests remained.

Possibility of completing this certification was reopened recently in a formal application by Ambrose to resume these tests. This would involve less than five hours flight testing, the company estimates.

Outcome of this bid, however, remains uncertain due to a 1953 amendment to Part 3 which limits certification under its rules to 12,500 lbs. maximum. Although CAA has not formally denied approval, Ambrose officials indicate it now appears questionable that authorization to certificate the 43,500-pound trimotor will be granted. ♦♦♦

Colonial Aircraft To Deliver Amphibian

Colonial Aircraft Corp. of Sanford, Me. has delivered its first Skinner Amphibian, with two more scheduled for August 15 delivery. The production line is geared for the first ten, with the second run of parts for ten more to start in about four weeks.

To date, Colonial has appointed eight franchised distributors in exclusive territories in the U.S., Canada and Latin America. They are as follows:

Alaska, Frontier Distributors of Spenard; Canada, Lund Aviation Ltd., Montreal.; Minnesota, Wisconsin, Illinois, Indiana and Michigan, National Aero Sales Corp., Chicago; New York, New Jersey and Pennsylvania, Jack Strayer, Inc., The Bronx, N. Y.; New England, Huck Aircraft Corp., Greenwich, Conn.; Florida and The Bahamas, Amphibious Aircraft, Inc., Fort Lauderdale, Fla.; Gulf States Area, Louisiana

Aircraft, Inc., Baton Rouge, La.; and Mexico, South America and the Caribbean, Eternitas Corp., Caracas, Venezuela.

Plane Builders Ship 2,324 in Four Months

A total of 2,324 personal and executive aircraft were shipped by seven manufacturers for the first four months of 1956 for a total dollar value of \$33,809,000, the Utility Airplane Council of the Aircraft Industry Association reports.

Cessna led the seven in both numbers of units shipped and total dollar value.

The company delivered 1,154 of its models, valued at \$12,875,000. Beech was second in dollar value and Piper second in number of units. Piper shipped 838 planes at \$7,967,000 and Beech delivered 261 at a dollar value of \$9,832,000.

Aero Design came in third with 37 units shipped at a value of \$2,852,000. Other shipments included: Mooney, 21 airplanes at a dollar value of \$170,000; Taylorcraft, nine at \$90,000; and Callair, four at \$23,000.

Briegleb Aircraft Producing Sailplane

Briegleb Aircraft Co. is in production on the BG-12, a new single-place, high-performance sailplane of plywood construction, which it will follow with a two-place version, to be known as the BG-15, in October.

Two other models in the series, one a single-place utility glider, called the BG-11, and the other a two-place version, the BG-14, will be ready for delivery later in the year. All four models have three-piece wings, the only difference between those on the high-performance sailplanes and those on the utility gliders being in the wingtip section.

Designed by William G. Briegleb, operator of El Mirage Field in California and a veteran of the sailplane arts, the BG-12 is described as having particularly effective 60-degree flaps which provide improved glide path control and allow a pilot to land in very restricted areas. The soaring craft also is said to have exceptional visibility, with a wide vision canopy made of flat sheet plexiglass.

Briegleb is marketing the new sailplane ready to fly complete at \$1,895 FOB factory and in kit form. There are three types of kits, one complete except final assembly for \$1,595, one with all pieces and parts cut out and shaped and the more difficult assemblies made for \$995, and one with all materials, including basic instruments, furnished, but no assemblies made at \$695.

BAD GODESBERG, GERMANY —“Can't you get the American aircraft industry to realize that it is missing out on one of its biggest potential export markets?” Herr X pleaded as we sipped Rhine wine and consumed huge veal cutlets.

We were among the several hundred attendants at the annual get-together of the German Aircraft Industries Association. Known as the “Be-grueszungsabend,” the evening party before the formal meetings is an occasion for old friends (and enemies) to chew the fat and air their gripes.

There is certainly no lack of griping among the men who are trying to put the German aircraft industry back on its feet. By and large, the gripes are justified. The German government is moving at a snail's pace in handing out contracts that have been under negotiation for well over a year.

Some \$200 million worth of initial business is at stake. The German aircraft industry has no single government agency to which to turn. At present it has to deal with the Finance, Defense, Commerce and Transport ministries, which pass the buck between themselves.

• While the German government is moving too slowly to please the aircraft industry, some of Germany's NATO allies are trying to do the reverse. That's Herr X's complaint. “How on earth can we start building F-100s next year when we haven't even begun producing lightplanes as yet?” he asked, (rhetorically I presumed, for I could think of no intelligent answer). “Besides, he added, “it's going to be tough enough to build small stuff with the present shortage of engineers.”

Herr X pointed out in no uncertain terms that the U.S. aircraft industry every day is sapping Germany of its best aircraft engineers. “How can you send recruiting teams for engineers to work in the States at the same time that you send other groups to have us build aircraft for NATO?” he asked (once again, rhetorically I presumed).

Herr X opined that the people who should come to Germany are component manufacturers: “The big German firms don't think it worth their while to tool up to produce just a few hundred fuel pumps or similar items—our aircraft companies have to get their components from somewhere.”

Another area where the market is wide open is in light aircraft for private flying. The Germans are very keen to buy personal planes and the government will let them spend dollars to do so. Despite these and other inducements,

the U.S. aircraft industry seems to be apathetic toward the German market.

“Why is it that United Aircraft Export Corp. is the only American firm

that seems really on the ball in Germany?” Herr X asked in a manner that this time clearly demanded an answer. I'll try to find out.

Friendship Can Be Flown by One Man

AMSTERDAM—The Dutch CAA late last month gave the Fokker F-27 Friendship a provisional certificate of airworthiness. Company officials are particularly proud that this certification enables the aircraft to be flown by a one-man crew, if need be—an important advantage for ferrying.

The fact that one-man operation is permitted by the Dutch CAA testifies to the Friendship's simplicity, and this was amply demonstrated to this writer recently when he was allowed to occupy the second pilot's seat for a 70-minute test flight.

Hugo Burgerhout, Fokker's chief test pilot, put the aircraft through its paces at a gross weight of about 33,000 lbs. (lead and water ballast were used to represent a full payload). Single-engine performance was particularly impressive.

The Friendship will climb on one engine at 90 to 95 knots at 800 to 900 feet a minute up to a maximum altitude of 18,600 ft. It will cruise at 150 knots at 10,000 ft. on one engine. In turns with the critical (right) engine feathered, the aircraft is very stable and shows no inclination to roll into the turn.

• Stalling characteristics are exceptionally favorable. With power off, wheels down and flaps in the approach position (25 degrees) the warning buffeting comes at about 90 knots and the stall occurs at about 70 knots. With flaps fully down the stall comes at about 65

knots. In all cases the buffeting is very mild and there is no tendency for the aircraft to drop a wing.

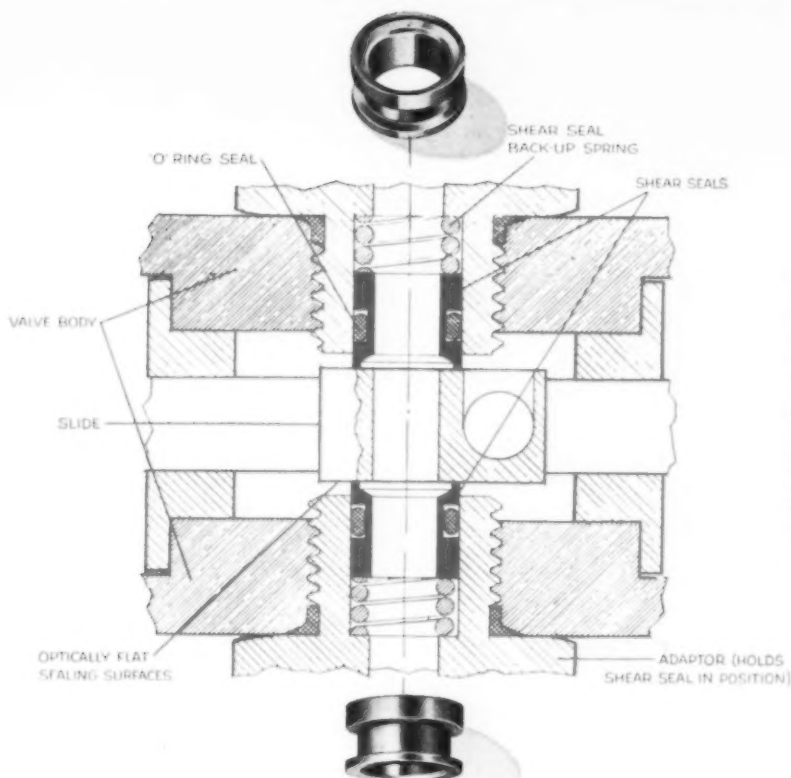
Takeoffs and landings are speedily accomplished. To the astonishment of Amsterdam airport's tower on our landing we pulled up after a run of only 700 ft. Plenty of power is available quickly for use in the event of a balked landing. The gear comes up and goes down very quickly. Because it is pneumatically operated there is an unusual hissing noise accompanying its movement.

There was one slight criticism to make about the aircraft's handling—the ailerons were very stiff. However, this should be rectified soon. The aircraft went into the shops on June 30 for the fitting of new ailerons which should be a lot lighter to control. As of that date the Friendship prototype had logged 135 hours. By the end of the year the total should be 400 hours and by the end of 1957 the two prototypes should have accumulated 1,000 hours.

The second Friendship prototype should be flying next January. It will be three feet longer than the first and will be pressurized. It will, in fact, be an exact replica of the first production aircraft which is due to be delivered (to Aer Lingus) in the second half of 1958. Fokker plans to build 10 to 15 aircraft in 1958 and is tooling for an ultimate production rate of six Friendships a month.



Fokker's chief test pilot Hugo Burgerhout stands in front of the Fokker Friendship with Vandyk after giving him a demonstration flight in the prototype of the Dutch turboprop transport.



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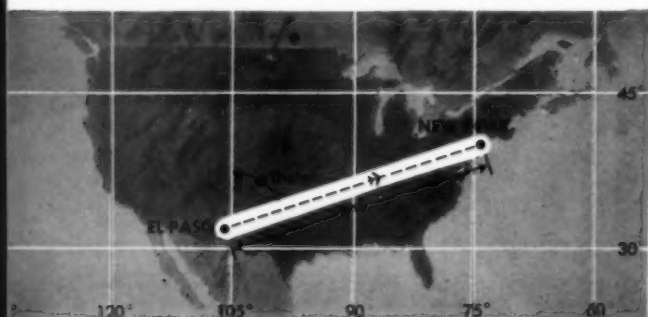
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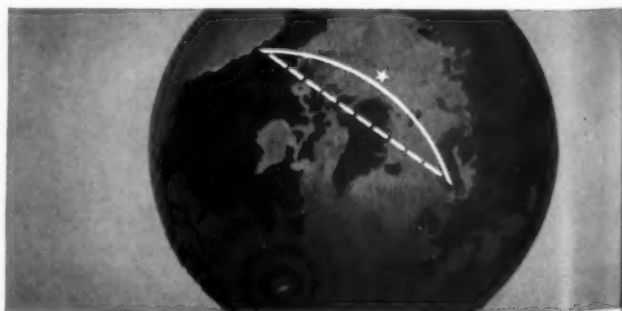
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TRANSPORT TRENDS

Washington, D. C., July 30, 1956

LOOK FOR NEXT SESSION OF CONGRESS to take active interest in CAB policies regarding local service airlines. Several Senators are more than mildly interested in the fact that locals have had no earnings in 10 years, despite phenomenal growth. Also, that CAB policies toward locals haven't changed since days of temporary certification. The carriers, meanwhile, have presented their problem forcefully (see page 64). But they still appear to lack an effective solution. Some are hoping for a special government fund to help them through re-equipment programs.

WHEN CAB DECIDES what action to take on International Air Transport Association's proposed transatlantic fares adopted at Cannes, it will be choosing between (1) strong State Dept. support for the fares, (2) equally strong opposition from its own staff. Some prominent staff members are willing to let an "open rate" situation develop this fall, rather than okay the fares.

AS THE AIRWAYS PROGRAM IS ACCELERATED, spotlight is focused on antiquated pay scale of airway and air traffic controllers. Highest salary now paid is about \$7,500 to \$8,000 for chief controllers. Assistants start as low as \$4,500. To make matters worse, Civil Service Commission, after three years of negotiating with CAA, has issued revised standards that would result in downgrading of 30 to 40 controllers in September. CAA has appealed the Commission action.

CAA has proposed standards that would involve little, if any, downgrading. Instead, they would raise by one grade controllers working in high-density towers and centers (200,000 operations a year, including 7,500 instrument). Chiefs would have a salary potential of \$10,000. Apprentices would start at \$5,200.

Unexpected support has come from Senate Appropriations Committee, which feels that even this scale is too low for the highly sensitive work performed.

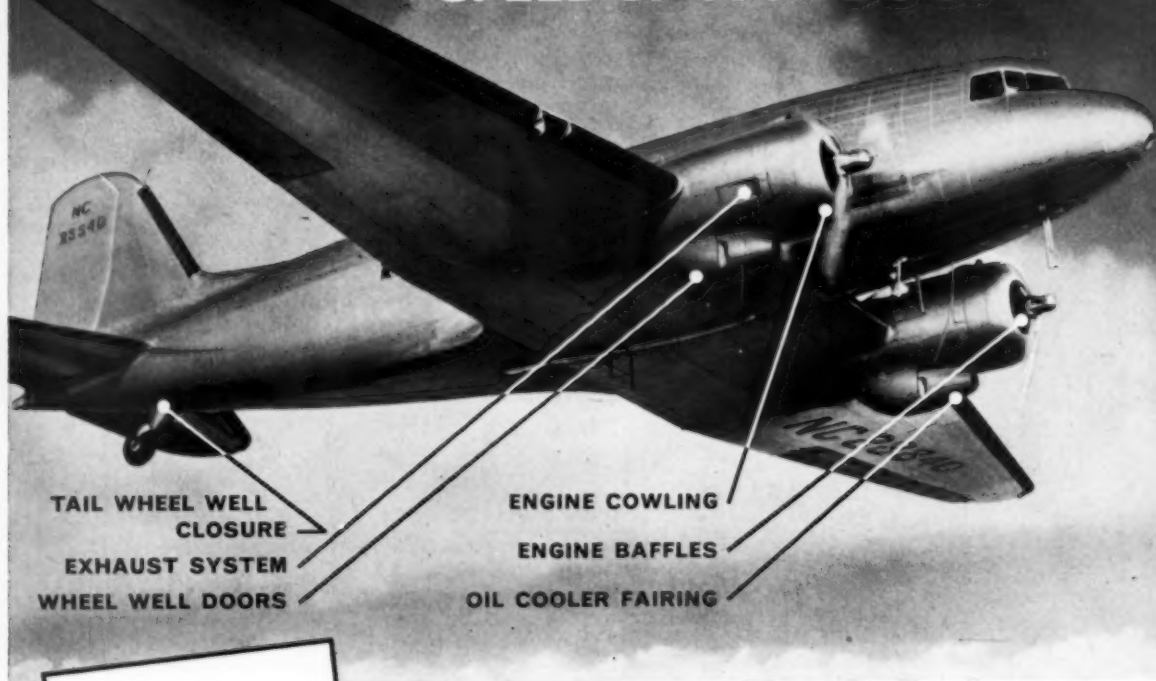
LOSS OF TWO PLANES in Grand Canyon accident will be costly to United and TWA in carrying capacity during remainder of 1956. The two companies' available seat-miles will be reduced by at least 45 million. At 60% load factor the UAL DC-7 and TWA Super Connie would have produced almost \$1.5 million revenue in last half of the year.

NON-SCHEDULED AIRLINES, known as "supplemental air carriers" for past seven months, will forfeit that name in favor of "large irregular carriers" on Aug. 4, if recent Court of Appeals decision isn't stayed (see page 11). In remanding CAB's controversial non-sked decision, court also wiped out the 10-flights-a-month rule and rights of non-skeds to advertise regular scheduled service.

HOWARD HUGHES HAD PLANNED to announce his remaining Boeing 707 order for TWA several weeks ago, but TWA-United accident caused postponement. Announcement could come at any time now.

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TRANSPORT AVIATION

N.Y.-Fla. Case: Battle Royal for Lush Route

Congressmen, governors, mayors, civic leaders pack Commerce Department auditorium for CAB hearings on 'third carrier' proposals.

By WILLIAM V. HENZEY

THE MOST BIZARRE route proceeding in recent Civil Aeronautics Board history—the New York-Florida Case—is finally before the Board for decision.

Normally, a final ruling could be expected in the Fall, allowing time for deliberation, opinion-writing, possible dissents, and reproduction. But nothing about the case has been normal thus far and there are no signs pointing to a change to normalcy in the immediate future.

For four solid days this month the battling which has raged in all important eastern seaboard cities, in the halls of Congress, and in the press, was concentrated at oral argument before CAB in the gloomy but spacious confines of the Commerce Department auditorium in Washington. Even the site was unusual, marking only the second time in 18 years that CAB was forced to vacate its usual oral argument room to accommodate the crowd.

In all, 71 people—including attorneys, members of Congress, governors, ex-governors, mayors, and other civic leaders—appeared before the Board consuming 26½ hours and compiling 828 pages of oral transcript.

Issues Seem Clearcut

• **Stated as simply as possible**, the issues are: (1) Is there a need for additional competing service in the Boston-New York-Florida market and (2) if so, what carrier, or carriers, should be certificated to provide the additional competition?

Eastern Air Lines and National Airlines, now in the market, are defending against new competition. "A certificate," thundered NAL's counsel John W. Cross, "will not create a single additional airplane or a single airplane seat."

Seven companies, CAB Examiner Thomas L. Wrenn, and CAB Bureau Counsel V. Rock Grundman disagree with Eastern and National. Wrenn said there's a need for a third carrier and that Delta Air Lines, one of the seven applicants, should get the route. Grundman agrees on the need but would certificate Northeast Airlines, another of the seven.

• **Other aspirants** are Pan American

World Airways (short on lower echelon CAB support but long on Congressional and big city backing), Capital Airlines (which ranked second to Delta in Wrenn's findings), Resort Airlines, Riddle Airlines, and Trans American Airways.

Figuratively speaking, a "new Board" must decide the case. Vice Chairman Joseph P. Adams, and Members Chan Gurney and Harmar D. Denny are holdovers from last year's "big three" route cases which opened the door generally to major trunkline route expansion. But two important votes rest with new Chairman James R. Durfee and Member G. Joseph Minetti, who are involved in a major airline route case for the first time.

One of their first jobs is to decide what weight to give to all the Congressional and civic representations which, unlike most cases, involve support for specific carriers. Generally, such representations favor new service but no specific applicant.

Twelve Senators Back Northeast

For example, first witness at oral argument was Sen. Frederick G. Payne (R-Me.) who furnished evidence that New England's 12 Senators were solidly behind Northeast. Before the argument was completed, six of those Senators modified their original stand to indicate support also for a second new carrier (unnamed).

Payne was followed by Rep.

Chester E. Merrow (R-N.H.), who read a letter signed by 21 of New England's 27 Congressmen, all supporting Northeast. Some of those then added their support to Pan American's bid, as did the State of Maryland through its governor and two senators.

Numerous other members of Congress voiced their support of Delta, National, and Eastern and, in the last hour of the four-day argument, the New England Governors Committee on Public Transportation cast a vote for both Northeast and Pan Am.

With all this as a major stage-setting, CAB must choose between the argument of the defending lines, Eastern and National, and proposals of the seven applicants. Briefly summarized, these were the closing arguments of the battling carriers in order of presentation:

• **Northeast:** Attorney Henry E. Foley argued that all present intermediate-sized trunks started from "very humble beginnings . . . and were allowed to grow, through access to long-haul high-density markets. Northeast seeks (through a New York-Washington-Miami extension) only what these other carriers have already received by way of route strengthening." If its application is approved, Foley said NEA would start service in 30 days.

• **Capital:** "Long-haul outlets are needed," argued attorney Charles H. Murchison. Awards to Capital in last year's big route cases, he said, "straight-

Convair 440 Starts European Service



Convair 440 Metropolitans have gone into service in Europe. Sabena's first is shown as it arrived at Brussels. Belgian airline has 12 on order. Planes are equipped with weather radar. Other European carriers that have ordered 440s: Swissair, SAS, Lufthansa, JAT, Iberia, Alitalia and Aero O/Y.

ended out certain route restrictions but didn't add a single new point." He said Capital's Viscounts can "more than hold their own" in the New York-Florida competitive market.

• **Delta:** Former CAB Chairman L. Welch Pogue said his company "meets perfectly" all the requirements of the standard of "what is most in the public interest." He noted that DAL proposes 62% coach operations in the New York-Florida market. "On all the merits," Pogue concluded, "apart from the off-stage tumult and shouting—the quiet pull of the public interest tide is that Delta be given the additional authority to do the job."

• **Pan American:** Henry J. Friendly said Pan Am, seeking its first domestic route, figured it had to do better than twice as well as any other applicant to get the route. "We think," he added, "we have done considerably better than this self-imposed requirement and if you find PAA's case only a little better than its closest rival, don't select us."

• **Resort:** The tour operator offered a "unique" passenger proposal which its counsel William C. Burt characterized as the "most logical answer" in the case. Resort proposes operation of full schedules during the peak winter season and limited week-end and holiday schedules during the off-season.

• **Riddle:** The all-cargo carrier proposes sharp cuts in coach fares if granted an east coast passenger authorization. Attorney Jerrold Scoutt, Jr., said Riddle's proposed 31% reduction in coach fares would save travelers about \$5 million annually and, if Eastern and National matched the fares, savings would run as high as \$20 million a year.

• **Trans American:** Attorney Walter Hansen argued that scheduled carriers in the New York-Florida market need the low-fare competition that only Trans-American can offer. He told CAB Member Gurney his company is currently operating three daily round-trips between New York and Miami.

• **Eastern:** E. Smythe Gambrell described the New York-Florida route as the "best developed and most competitively serviced route in the world." He said over 50 carriers are now in the market, noting that peak demands can be met by the 49 supplemental carriers who, under the Board's 10-flight-per-month rule, could provide 490 monthly flights between New York and Miami.

"Despite the clamor of opposing interests," Gambrell told the Board, "I trust you will reassure the American people that we still have the rule of law and not of whim and caprice."

• **National:** Attorney John W. Cross said the "most essential point is that this record does not show that the public will be inconvenienced or bene-

fited in any way whatsoever by the addition of another carrier. This is true regardless of whether we talk about the type of service—the degree of competition—the cost—or the availability of service."

Cross argued that certification of a third carrier could force National back on subsidy since 73% of its revenues would be subject to diversion.

Case May Be Reopened

But while such oral arguments spell the final procedural step in a CAB case, not so with the New York-Florida Case. For example, shortly before oral argument started on July 10, National and

Eastern filed jointly to reopen the record for further hearings on the "fitness" of Northeast and Pan American.

Pan American immediately filed for summary dismissal, accusing National and Eastern of delaying tactics. NEA also was expected to file.

Should CAB deny or dismiss the petition, it could turn to deciding the route case. Two courses are then possible. Normal one is to issue a decision after completion of an opinion, etc. The other would be announcement of the decision as soon as it's reached, with issuance of a formal order when all details are completed. ♦♦♦

BEA Considers Jets For Long Hops

British European Airways is considering ordering a small quantity of jet transports "to protect our competitive situation," chairman Lord Douglas of Kirtleside told AMERICAN AVIATION in an exclusive interview. Various types are being examined but the corporation is a long way from a decision, he said.

BEA planners have estimated that the DC-8 will take only half an hour less than the turboprop Vanguard on the London-Rome route, BEA's longest stage.

"Nonetheless," Lord Douglas pointed out, "we don't want to be caught short if passengers insist on jets."

• **BEA's chairman** believes that the problems of introducing the jet transport may have been underestimated in the United States. "Certainly," he said, "a jet on a short run like New York-Washington or London-Paris is nonsense. Turboprops will continue to make up the bulk of BEA's fleet for the 1960 decade."

The question of replacing the DC-3 has now been settled by BEA, Lord Douglas revealed. Instead of buying a new type, "written-off" Viscount 700s will be used. This will be more economical than buying a new model

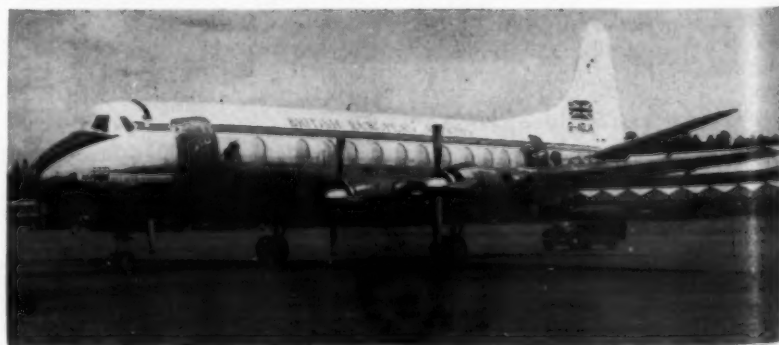
(like the Fokker Friendship, which Lord Douglas much admires). The Viscount will be able to get into all the airports currently served by BEA DC-3s. It is likely that the last DC-3 will be withdrawn from service in 1960.

The piston-engine Elizabethans (Ambassadors) will be taken out of service by the end of 1958. Elizabethan routes will be flown with Viscount 800s, 22 of which are due to be delivered to BEA next winter. An option for 12 more probably will be exercised, Lord Douglas indicated. BEA is also buying 20 Vickers Vanguards. The first will be delivered in 1960.

• **BEA is budgeting** for a \$2,100,000 profit for its 1956-57 fiscal year, Lord Douglas revealed. The profit for the last fiscal year (through March 31, 1956) was \$1,820,000. Traffic is booming, with the greatest increase on domestic routes. This is embarrassing, Lord Douglas pointed out, because domestic fares are too low to enable a profit to be made. Increases are needed, but British procedure to permit these is lengthy.

Discussing future routes, Lord Douglas revealed that BEA will soon start operations to Dublin. Hitherto, Aer Lingus has had a virtual monopoly

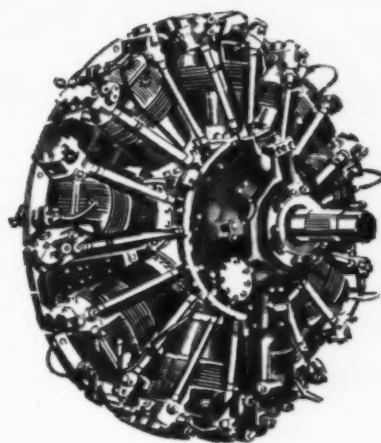
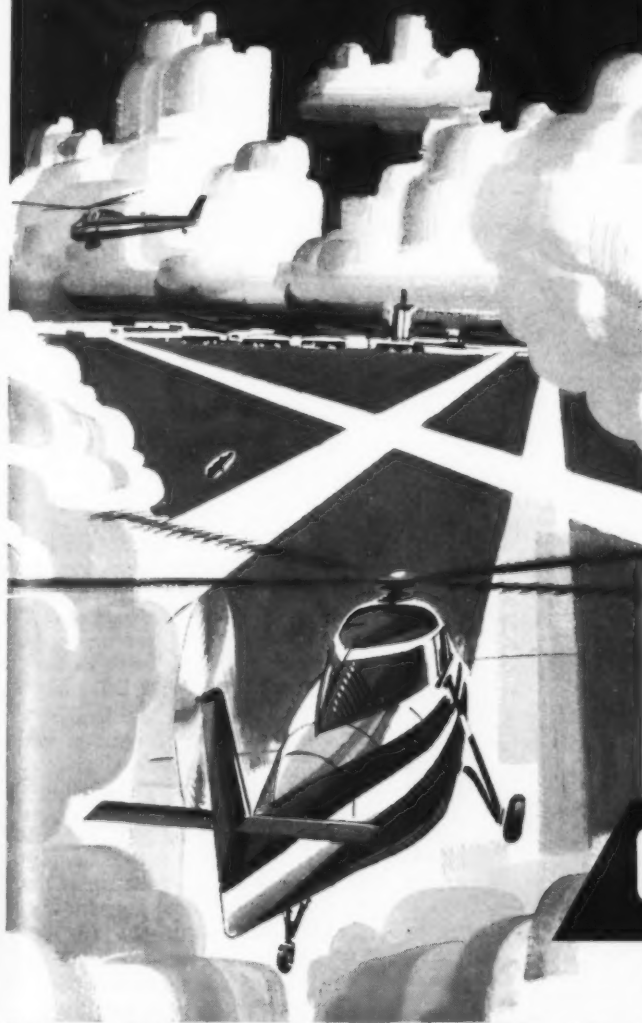
Pressurization Tests for Viscount 800



Vickers-Armstrongs has rolled out the first Viscount 800 for pressurization tests. Note new shape doors and additional windows ahead of propeller.

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JULY 30, 1956

of services to and from the Irish capital. Initially BEA will operate about 25% of all London-Dublin flights, with the Irish airline flying the balance. Aer Lingus is to be given fifth freedom (full traffic) rights out of Manchester.

Lord Douglas is eager to see BEA start service to Moscow. He visited the

Soviet capital last year and made all the necessary preliminary arrangements with Aeroflot. All that now remains is for the British government to come to terms with the Soviet government.

Lord Douglas expects that, once the Moscow service is approved, the Polish and other satellite governments

will want to have BEA serve their capitals. BEA hopes soon to start service to Yugoslavia but the stumbling block is the question of fifth freedom rights at intermediate points and at Belgrade. BEA wants to operate its London-Belgrade service beyond the Yugoslav capital. ♦♦♦

What Local Carriers Need to Get Off Subsidy

The local service airline industry, emphasizing a re-equipment program as the only avenue to self-sufficiency, took its case directly to the Civil Aeronautics Board this month.

Armed with voluminous charts and an extensive economic study of their ten-year history, the locals said they can't get off subsidy with DC-3 equipment, despite maximum efficiencies, and can't replace DC-3's without earnings. Since earnings have been non-existent during their lifetime, the locals urged a re-appraisal of basic CAB mail pay policies.

Presidents of all local lines joined John F. Floberg, counsel of the Conference of Local Airlines, in making the presentation to CAB July 18.

• **Performance of the industry** has lived up to predictions made ten years ago in all its service aspects, they told CAB, "but financial results have been most discouraging." "Absence of earnings," they added, "has brought about a deterioration of financial condition which seriously impairs the industry's ability to expand and develop soundly in the years ahead."

Without earnings, the locals said they are seriously hampered in obtain-

ing debt financing (loans) on "an acceptable basis," and "it is improbable that new equity capital can be attracted on any reasonable basis."

• **The locals criticized CAB mail rate policies** with respect to (a) use of a return on investment in figuring earnings, (b) use of operating margins, (c) disallowances in past-period rate determinations, and (d) the sliding-scale formula.

For determining earnings, the local industry recommended that CAB adopt "composite standards" for determining earnings elements in past and future period rate cases under which the carrier would receive earnings based on a "blend" of the following elements:

- An adequate return on recognized investment.
- A rate per aircraft mile.
- A rate per available seat-mile.
- A rate per revenue passenger mile.
- A rate per dollar of non-mail revenue.
- A rate per passenger enplaned.

Such standards, the carriers argued, would "tend to reduce the disadvantage likely to be inherent in a weaker route system, so that individual carriers would not have to pay a penalty for differences

in the economic and geographical characteristics of various sections of the country."

• **The industry hit the "operating margin" technique** which, the carriers said, produces a return element of about 2¢ a mile after taxes. On an average DC-3 operation for one year, productive of about \$6,100 net per plane, each DC-3 would have to operate for 99 years to earn the purchase price of its replacement. This, the locals said, "is a hopeless prospect."

CAB "disallowance practices" were shown to be completely confiscatory of past-period earnings. A review of 20 past-period mail rate cases shows that CAB adjusted the reported breakeven need of the carriers downward by more than \$2,302,000 while the earnings element in the cases totalled only \$2,049,000.

"Thus," the locals said, "past-period disallowances have confiscated past-period earnings at the rate of 112%."

• **The point of this argument**, the carriers continued, is that CAB disallowances are made "on the basis of substitution of Board judgment in matters of management prerogatives . . . It appears that where the Board has needed the advantage of hindsight in order to judge the issue, management can hardly be fairly convicted of failing to meet statutory standards."

The locals emphasized there is "no important opportunity for reducing the public subsidy through new economies of operation." And they termed it "an absolute impossibility" for the locals to attain the 78% load factor needed to break even with present DC-3 fleets.

"The remedy for the local service problem is a level of earnings which will put them in a position to arrange for the financing of more efficient fleets," they said.

• **In conclusion:** "The essential policy problem posed to the Board is the choice between an affirmative and constructive developmental program or continuation of the status quo."

CAB is expected to study the carriers' proposal for the next 30-60 days and another meeting between the Board and local industry is likely in the Fall.

Retractable Air-Stair Door for Viscounts



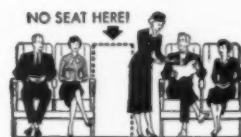
Retractable air-stair door is now being installed by Vickers-Armstrongs on Viscounts delivered to Capital Airlines. The 260-lb. door is built for Vickers by Heston Aircraft Co., Heston, Middlesex, England. Power for retracting is furnished by a separate electric motor driving a hydraulic pump. The air-stair folds into three sections during retraction, and certain lengths of the hand-rail telescope.

What airline gives a man elbow room?

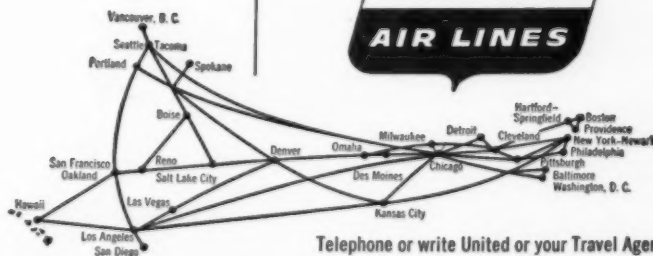
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First Issue Off Press, October, 1956

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CAB Wants Hughes To Testify on Jets

Civil Aeronautics Board lawyers want Howard Hughes to testify at hearings in Los Angeles on Aug. 21 about Hughes Tool Co.'s proposal to make and sell jet transports to TWA and other airlines.

The Board is investigating to determine if the plan violates its approval of Hughes Tool's control of TWA. CAB Examiner Edward T. Stodola has indicated that all details surrounding Hughes' decision to build jets, plus available future plans, will be brought out at the hearings. Several years ago Hughes testified at a CAB hearing on the TWA control issue.

Collision - Prevention Systems: Two Camps Form

A "battle of the systems" for in-flight collision prevention may be in the offing. There is a division of opinion on how to solve the problems. These problems and the attacks on them revolve around the technical as well as the economic and operational ramifications.

Aside from those who believe the problem can best be solved by rigid and precise control of all air traffic at all times, the technical parties are lining up either on the side of a self-sufficient or a cooperative airborne system.

- **The first group** believes that economic and political problems inherent in fitting *all* aircraft with cooperative gear present staggering complications.

- **The second group** believes that some type of scanning radar would be an effective *aid* rather than a 100% cure.

The problem is an old one. Interest in equipment to prevent collisions goes back many years. As early as 1946, Airborne Instruments Laboratory in cooperation with the Air Transport Association did a cooperative analysis of the problem covering the application and attributes of different electronic techniques to collision prevention.

ATA sent inquiries to manufacturers asking their expression of interest in equipment development for collision prevention. The responses showed little or no manufacturer interest, and some said it could not be done.

Four organizations are known to be studying the technical problems. **Ramo-Wooldridge Corp.** is said to have recently proposed development of a self-contained system to ATA. R-W and ATA negotiations were in the discussion stage when the Grand Canyon accident occurred.

- **Bendix Radio**, division Bendix Aviation Corp. has been studying the physics of the problem. It concluded that "an effective self-

contained airborne collision avoidance system is now, and will continue to be out of the question."

This Bendix stand however, is understood to have undergone modification after a recent ATA-Bendix meeting in which the bases on which Bendix drew its conclusions were modified. These involve the very important matters of tolerable aircraft stresses and discomfiture to passengers that might be incurred in an evasive collision-preventing maneuver.

- **Dr. James Q. Brantley, Jr.**, Cornell Aeronautical Laboratory, Inc. has been studying the problem since 1949, and is still engaged in this work at Cornell. Brantley believes the fastest way to get the job done is to perhaps develop self-contained systems for use in most equipped aircraft and install transponders in a limited class of planes such as very high performance military aircraft. Detection of such planes is needed at a great distance because of their speed.

Melpar, Inc. is reported to be ready to discuss application of their know-how in Doppler and other radar techniques to aid progress in the field, but have no system proposal firmed-up.

ATA has given "top-priority" status to their study of needed planning and a committee to handle the work has been enlarged recently with trunk and other airlines invited to participate. They plan to raise money to support a development project. William Littlewood, vp-equipment research, American Airlines, Inc. will chairmen the group.

Radio Technical Commission for Aeronautics' Special Committee 74 working on operational requirements for a proximity warning system has completed its report on "an initial approach" to the problem. Such a device, the committee said, "would provide useful service, and will facilitate later development and use of a Collision Warning System."

Braniff Plans Loan And Stock Issue

Braniff Airways has made arrangements to borrow up to \$40 million from a group of insurance companies, and has filed a registration statement with SEC covering a proposed offering of 1,105,545 shares of common stock.

Proceeds from the loan and the stock will finance the company's fleet enlargement and modernization program.

Notes on the loan, which was negotiated by F. Eberstadt & Co., New York, will mature in 1976. Funds may be drawn as needed through 1960.

GE Gets Two Contracts Totalling \$107.5 Million

Two USAF contracts totaling \$107,540,320 have been received by General Electric's Aircraft Gas Turbine Division at Evendale, O.

One contract, amounting to \$102,415,320, calls for manufacture of J79 engines, while the other provides \$5,125,000 in facilities for an "advanced engine development project." The J79 contract will provide a "further stabilization of plant operation and only a modest increase in employment," a GE official said.

split second action SAFETY WIRES 3 TIMES FASTER

A major Air Force Base cut engine wiring time from 120 to 40 man-hours ... saved \$140 per engine; Manufacturers report time cut as much as 75%.

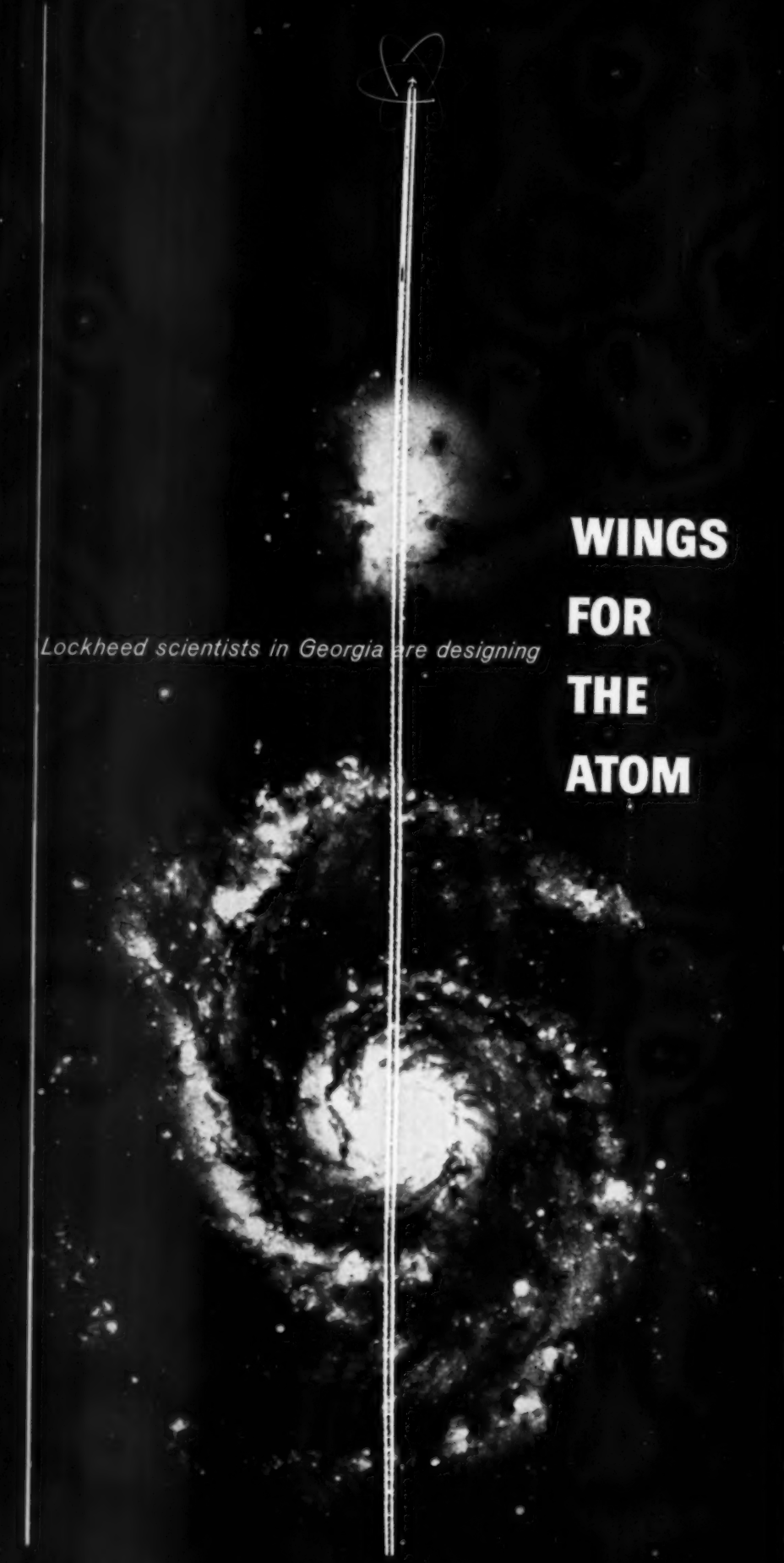
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Lockheed scientists in Georgia are designing

WINGS FOR THE ATOM

Domesticating the atom to serve mankind has intrigued science for over a decade. One top priority application, secretly under way for several years at Lockheed: developing a nuclear-powered plane as different from present types as a supersonic jet is from the first stick-and-wire biplane.

IMAGINE A GIANT AIRCRAFT SOARING ALOFT, NOT WITH TONS OF GASOLINE, BUT WITH A URANIUM FUEL SUPPLY NO BIGGER THAN A HANDFUL OF GRAVEL. EVENTUALLY, SUCH A PLANE-OF-THE-FUTURE—WITH THIS SCANT FUEL SUPPLY—WILL GIRDLE THE GLOBE NON-STOP BETWEEN SUNRISE AND SUNSET.

More than a dream, this incredible aircraft is now being developed by Lockheed for the U.S. Air Force despite problems of propulsion, structures and materials, thermodynamics, crew survival, producibility and maintenance unique in aviation. Old concepts are being shelved, traditional solutions rejected. The kind of aeronautical advances that once took a generation of research are now being telescoped into a few months, even weeks.

Soon several hundred nuclear scientists and engineers from Lockheed's Georgia Division will move to the North Georgia mountain country. There, on a vast site—some 40 miles from U.S. Air Force Plant No. 6 at Marietta, operated by Lockheed—will be built the nation's largest facility for the development of atomic-powered aircraft.

The exact status today of the atomic plane is still a military secret. But this much can be said: The first nuclear aircraft to blaze across America's skies may not look essentially different from conventional planes, but functionally it can only be described as revolutionary. And after the nation's military requirements are met, the transports then available to you as a traveler will rank among the truly exciting events of aviation history.

YOU YOURSELF MAY THEN TRAVEL ABOARD A NUCLEAR-POWERED AIRLINER—CROSSING THE COUNTRY IN AN HOUR OR TWO, OR SPANNING THE ATLANTIC IN LESS TIME THAN IT NOW TAKES TO GO FROM CHICAGO TO NEW YORK.

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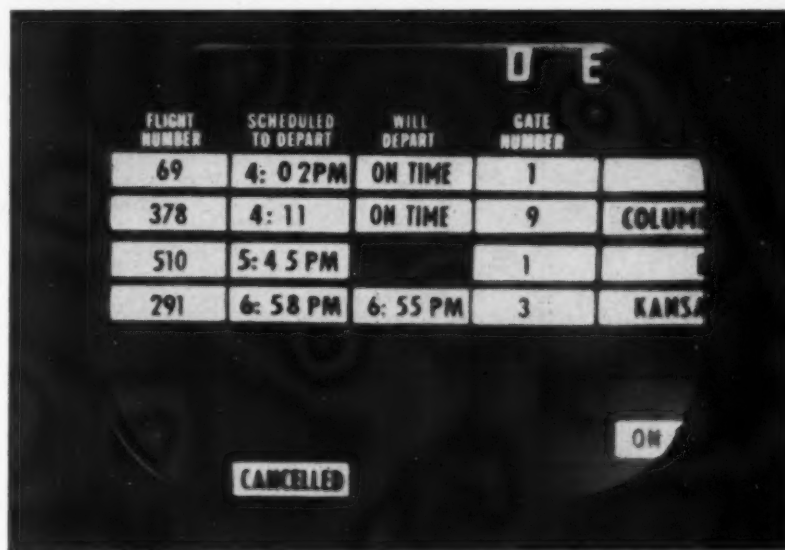
LOOK TO LOCKHEED FOR LEADERSHIP

In the July 2 issue we called the inadequate baggage room at Washington National Airport "disgusting and disgraceful," and said that CAA ought to do something about it. Now comes a note from Jim Pyle, CAA's Deputy Administrator. "We have recognized for some time that additional baggage room space was needed and although it has taken more time than has been desired, a contract has been negotiated to build an additional baggage room which should greatly alleviate the present congested condition," he says. "I thought you would be interested in knowing that we are moving in the direction of correcting the situation." Indeed we are, and cheers for CAA.

Attention, passenger agents. How many times have passengers tried to throw their weight around by claiming that they're personal buddies of your president? A United Air Lines agent asked UAL president W. A. Patterson what his feelings were toward such people. Pat's straightforward answer: "I have many wonderful friends, but I do not think it would be humanly possible for any individual to have as many friends as I hear about as I travel over the airline . . . I feel that (UAL service) is of such high standard that what is good for all passengers is good for my friends. Often people have particular problems, but I find . . . that under those circumstances my friends contact me or my secretary. If there are any special arrangements to make, I think we should make them rather than expect you in the field to do so. I can better explain my attitude by something which happened a few months ago. A close personal friend of mine was denied transportation because he had over-imbibed . . . He was quite annoyed with me and all concerned. However, I wrote to the station and commended them for their decision."

We quote the following from TWA's *Skyliner*: The importance of continuity and "follow-thru" in advertising is exemplified in an experience of Mr. William Wrigley, Jr., who was taking a plane trip. An individual asked him: "Why do you spend so much money on advertising? Everyone knows of your products. You shouldn't have to advertise all the time." Wrigley politely asked: "How fast would you say we are going?" "About 300 miles per hour," was the reply. "Then," asked Mr. Wrigley, "why doesn't the pilot turn off the motors?"

How TWA Uses TV for Flight Information



TV receiver behind TWA ticket counter at Kansas City brings latest flight information to passengers and agents. A monitor camera picks up the information from status board in flight operations section. If Kansas City experiment is successful TWA may use closed-circuit TV at other points.

Sales, Traffic, Promotion

TWA has installed a self-service baggage system at Chicago's Midway Airport . . . It has also started to pick up its own interline baggage from other airlines at Midway, instead of waiting for them to deliver it. Under the old system, as many as 200 bags a week failed to make connections . . . Company's model 1649 Constellations, to be delivered next year, will be known as Super Star Constellations. Name has been suggested by Lockheed for industry-wide use . . . TWA is offering three European tours in September for airline employees and their families who enjoy half-fare privileges. Details can be obtained from Al Pereira, TWA's Miami sales manager, Room 410 Calumet Bldg., Miami, Fla. . . .

Congratulations to Trans-Texas Airways on the novel coloring book that it distributes to young passengers. All the drawings that the kids color deal with the trip aboard TTA's DC-3. Inside front cover provides space for them to try to identify parts of the plane, and gives information on speed, weight, etc. Inside back cover has a system map on which the youngsters can circle the names of cities along their route. Educational and entertaining . . .

Pan American World Airways' films were booked a total of 1983 times on TV stations during the first six months of 1956. PAA's latest film is "Alaska—Our Pioneer Heritage" . . .

American Airlines' 1957 calendar will come in two sizes. One will be the standard calendar, 17 by 24 inches, with 13 pages and 12 illustrations. The other will be a "personal" calendar, 13 by 19 inches, also with 13 pages and 12 illustrations (almost as big as on the regular one). The pad will be ruled into boxes, with dates printed to one side. This

memo feature is designed to make the calendar useful in homes and offices. Reduction in size will permit hanging in limited wall space. AA is printing 116,000 standard and 30,000 personal . . .

Ethiopian Airlines has issued a mid-year calendar (July, 1956, through June, 1957). It carries four 11- by 14-inch reproductions of original color paintings of wild animals native to Ethiopia . . .

Northwest Airlines is sprucing up its passenger service. It has established a customer service division, headed by personable Jim Robertson, former Washington, D. C., station manager. All NWA station managers are now customer service managers, and their duties have been redefined. At larger stations, chief mechanics have taken over ramp, maintenance and hangar problems. Robertson's division has arranged 24-hour interpreter service to aid Oriental nationals on arrival at Chicago, New York, Seattle and Anchorage. It's furnishing baby strollers for mothers awaiting flights at larger stations. On international flights, by popular request, chess boards are now standard equipment. Also, in-flight position charts (revised every three hours by the navigator) are being furnished. An international dateline certificate is being re-established, and a dateline crossing ceremony will be added.

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United Air Lines, Inc.—W. A. Patterson, pres., \$100,000 salary, no bonus & indir.; R. E. Johnson, vp & asst. to pres., \$45,000 salary (up \$5,000), no bonus & indir.; J. A. Herlihy, vp-eng. & maint., \$46,000 salary (up \$2,000), no bonus & indir.; D. F. Margarelli, vp-transportation ser., \$45,000 salary (up \$4,000), no bonus & indir.; Otis E. Kilne vp & Coordn. of oper., \$45,000 salary, no bonus & indir.; D. R. Petty, vp-flight oper., \$40,000 salary (up \$3,000), no bonus & indir.; Curtis Barkes, vp-finance & property, \$32,000 salary (up \$3,333), no bonus & indir.; R. F. Aherna, vp-personnel, \$30,000 salary (up \$3,000), no bonus & indir.; Hal E. Nourse, vp-economic controls, \$27,000 salary (up \$1,000), no bonus & indir.; R. W. Ireland, vp-traffic adms., \$27,000 salary (up \$1,000), no bonus & indir.; S. P. Martin, secy. of corp. & asst. to pres., \$16,500 salary (up \$1,000), no bonus & indir.; R. E. Bruno, comptroller, \$16,800 salary (up \$800), no bonus & indir.; A. M. De Voursney, treas. & asst. secy., \$17,500 salary (up \$1,500), no bonus & indir.; Martin C. Ansorge, dir., \$3,250 dir. fees (up \$1,150), no bonus & indir.; Paul A. Bis-senger, dir., \$2,600 (up \$1,252), no bonus & indir.; H. Templeton Brown, dir., \$2,550 dir. fees (up \$750), no bonus & indir.; Gardner Cowles, dir., \$2,850 dir. fees (up \$750), no bonus & indir.; Justin W. Dart, dir., \$2,250 dir. fees (up \$700), no bonus & indir.; Thomas F. Gleed, dir., \$1,602 dir. fees, no bonus & indir.; Paul G. Hoffman, dir., \$2,750 dir. fees (up \$1,400), no bonus & indir.; Eric A. Johnston, dir., \$2,500 dir. fees (up \$950), no bonus & indir.; John J. Mitchell, dir., \$2,750 dir. fees (up \$900), no bonus & indir.; Aksel Nielsen, dir., \$2,452 dir. fees, no bonus & indir.; Vernon Stouffer, dir., \$1,252 dir. fees, no bonus & indir.

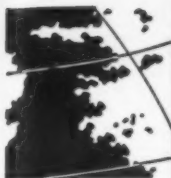
Persons other than officers, directors, and employees paid more than \$10,000 for personal services were: Mayer, Friedrich, Spiess, Tierney, Brown and Platt, Chicago, legal, \$261,990; Skidmore, Owings and Merrill, Chicago, architect & engineering, \$11,593; John R. Steelman, Washington, D.C. consultation, \$11,000; Arthur Andersen & Co., Chicago, audit, \$32,975; James Francis Reilly, Washington, D.C., legal, \$30,500; Merryrie Stanley Rukeyser, New Rochelle, N. Y., legal, \$11,000; Trippett, New-comer, Yoakum & Thomas, Los Angeles, legal, \$12,180; Theiss, Olson, Mechenburger, Von Holst & Colman, Chicago, legal (on patents), \$10,626; Holman, Nicklelalt, Mar-ion, Black & Perkins, Seattle, Wash., legal, \$11,005; Bohrer, Hibler and Replogle, Chicago, legal, \$12,000; Edwin Shields, Hewitt & Associates, Libertyville, Ill., consultation, \$20,234; Barrington Associates, Inc., N.Y.C., management consultation, \$32,185; Raymond Loewy Associates, Inc., Chicago, designing, \$110,946; Production Management Engineering Associates, Inc., San Francisco, engineering, \$16,831; H. J. Brunner, San Francisco, engineering, \$11,299; Harriman Ripley & Co., N.Y.C., agent fee in connection with debenture purchase, \$180,000.

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Farewell to USSR; Trouble in Bucharest

My Il-12 pulled itself through the mud and onto the turf for the takeoff at Odessa Airport. There was a definite engine warm-up. Despite my misgivings about a tricycle landing gear on an uneven turf field, the takeoff was short and smooth. We headed west over the rich farming country on the hour and a half hop to Bucharest, capital of Romania.

How can I really express my feelings on leaving Russia? I had been jittery. I was enormously relieved to be on my way out. It's hard to explain. Nothing had happened to me to make me uneasy, yet it was like claustrophobia. Others have told me they had the same urgency to get out. Part of my feelings were as a result of acute boredom, but there was more than that. Yet Intourist had done its best and I had been treated very kindly, all in all.

It was Wednesday noon. I was leaving U.S.S.R. but at best I couldn't be west of the Iron Curtain before Saturday night. I was to go through Romania, Hungary, Czechoslovakia, and my ticket even called for going through Poland. But I made up my mind to skip Poland and not stay over in Prague if I could get a connection out.

My seat belt wasn't working; the strap was much too large for the holder. The friendly stewardess said I shouldn't be concerned about it. I looked over my Bulgarian fellow passengers and watched the farm country until it was obscured by overcast. About twenty minutes out of Bucharest the overcast became broken. We were over farming country but the appearance had changed considerably. Then we descended and landed on a fine long concrete runway and pulled up in front of a modern and rather bright-looking glass-fronted terminal.

The Bulgarians must have been bigshots on their way back to Sofia because they were greeted here by a delegation carrying big bouquets of flowers.

Troubles Begin

I'm afraid my reception wasn't that good. In fact my troubles began in earnest. I was the only passenger disembarking. By process of elimination I found my way to the incoming room. There was a long wait for my baggage. Nobody spoke English but the uniformed gent who seemed to be in charge spoke some French. He was quite surprised when I handed him my American passport. He asked me how long I was staying in Bucharest and I told him only overnight although I didn't even know whether a plane was leaving next day. He asked how much money I had with me and then dis-

appeared into a back room.

I had no visa, which isn't exactly a comfortable situation to be in behind the Iron Curtain, but apparently the Foreign Office, which gave an okay to the American legation for me to come in, had notified the airport, because the guy came back and asked no more questions. But he went through all my bags, although he didn't disturb anything. So out I went with my bags to the main waiting room. I managed by sign language and French to get somebody to call the American legation, hoping they could give me some advice. At the legation the operator said everybody was out to lunch and I should go to my hotel. What hotel, I asked. She suggested the Athenaeum Palace.

So I tried to get a taxi. No soap. Various airport flunkies including a bedraggled porter all tried to be helpful but the language barrier was impenetrable. I finally concluded that they expected a legation car to come for me because I had called the legation. At last I found a woman who spoke enough English so I could explain that no car was coming and I wanted to go to town. Having gotten over that point, then there was a collective effort to get me on the next airport bus.

A local Li-2 (Russian-built DC-3) of TAROM, the Romanian airline, was arriving. I was to go to town with the passengers, so along with a bunch of poorly-dressed Romanians I got on the bus with my bags and the driver was told to let me off at the hotel. On the way in I was much impressed by the general layout of the city. Wide tree-lined avenues, some fine old homes, and sort of a French atmosphere. I realized that Romania hadn't been a Commie satellite very long and that Bucharest had once been a handsome city. But there were almost no cars to be seen anywhere.

I sort of felt like a five-year-old traveling unaccompanied with a dog tag around my neck explaining where I was to go. I was obviously a helpless foreigner and a westerner at that. Everybody really tried to help out. And sure enough, the bus driver pulled up

at the front door of the hotel and motioned for me to get out. Real service, and no charge. I didn't have any local money anyway.

At the reception desk nobody spoke English, but in French I managed to get a room (about \$6). It had hot and cold water and a bidet, but no toilet or bath. The hotel had recently been painted. Obviously it had been quite a place in its day and still was pretty well maintained. It was an enormous transition from drab Russia.

It was early afternoon and I was hungry. The spacious carpeted dining room hadn't lost its original elegance. The diners wore ties (I don't think I ever saw more than a third of the men in a Russian dining room wearing ties). The head waiter, in black tie, spoke some English. I had a pretty good meal of roast pork, cabbage, potatoes and ice cream, for which I signed my room number.

O'Sullivan to the Rescue

Then I called the American legation—somehow the telephone operator understood me—and in a few minutes a bright red Studebaker station wagon driven by Warrant Officer O'Sullivan drove up at the hotel entrance to pick me up. Brother O'Sullivan has achieved more public relations for America than 40,000 State Department foreign office birds who live in a world of their own. That Studebaker was the sensation of the Balkans. It attracted a crowd everytime it stopped. It was a symbol to Romanians that the U.S. with its vast superiority in industry, living conditions and individual well-being, was in existence. (How short-sighted the U.S. auto manufacturers are not to make certain our new products get behind the Curtain! But numb also are our government people.)

At the legation I called on a Mr. Champagne, a young chap, who looked me over as though I were a curiosity. It was he who had responded to my cable from Odessa. He said he had to go to the Foreign Office to get special permission for me to come to Bucharest. Then, still observing me as a rare bird, he said I was the first American traveler to come to Bucharest since the Commies took over.

At this I looked disbelieving and said I had a friend who was there some months back with some Congressmen. Oh sure, he said. Congressmen were given the glad hand. But I was the first individual American traveler. He said a Britisher had been in Bucharest several months earlier but I was the first American. Not only that, I was doubly rare because I had come in from Russia.

Reprints

The complete series of En Route on WWP's travels through Soviet Russia, Romania, Hungary and Czechoslovakia, which concludes with the next (August 13) issue, is being reprinted. Single copies are \$1 but special rates for bulk orders are available. Copies will be available by August 10.

So that was why I had had so much trouble. Believe me, one of these days my roaming inclinations will really get me in the wringer. I had no intention on this trip of being a pioneer in a Communist satellite. I had bought a circle airline ticket and just thought it would be interesting to go through Romania. Oh well, first or not, I was there. The next problem was to get out. The legation kindly arranged space on a Czech DC-3 leaving next morning for Budapest where, at least, I was expected.

I got a lift back to the hotel but only after asking for it. No one at the legation suggested I have dinner with them. The Minister didn't ask to see me and nobody suggested a meeting. (Brother, the State Department is a foreign world and whenever its interests happen to jibe with those of the ordinary taxpaying native-born American it is purely and solely coincidental!) Pardon my cynicism and sarcasm.

Dollars No Good?

I looked forward to another lonely evening with something less than enthusiasm. I wanted to talk to somebody I could understand.

At the hotel I got a shock. They wouldn't consider changing either greenback dollars or travelers' checks for Romanian lei. This meant no money for the evening or to pay my bill early next morning. No banks were open. By great luck I caught Mr. Champagne by phone at the legation just as he was leaving and told him my predicament (which he should have known would arise anyway, but then he was a fellow American!) and he agreed to send enough local currency with the legation driver next morning to bail me out of the hotel and enable me to pay the driver in dollars. I'd have been sunk without such an arrangement. Bucharest was the first place I've ever been where good old greenbacks were scorned and worthless. I knew I was too far from home for comfort.

It was now dark. I took a long walk, keeping my directions straight so I could find my way back. Prices in the shops were fantastic. One egg at 60¢ (using the official rate of exchange). An ordinary can of cocoa was \$5. A poor overcoat was \$115. Women's sweaters ranged from \$20 to \$85. Shoes of poor quality were \$20 and \$30. A woman's embroidered blouse was \$80. A man's leather coat was \$400—no kidding. Christmas tree ornaments were \$1 to \$5 each. Cheapest canned goods I saw started at 80¢. Lots of people were looking in the windows but few were buying.

Then on one of the main drags I came to what was obviously a big exhibit by Soviet Russia although I couldn't read the signs. I barged up to the entrance, found no tickets were being sold, so I joined the Romanians and went all the way through the exhibit. Nobody bothered me. There were lots of photo murals extolling USSR-Romanian friendship, big charts showing the growth of Russian heavy industry, some very old-fashioned agricultural equipment, and so forth. Quite extensive and well patronized. There was even an experimental television station, a closed-circuit deal, which

drew a crowd because the Romanians don't yet have TV.

It was fascinating to go through a big exhibit of Soviet Russia designed to impress one of its Communist satellites.

Coming from Russia, Bucharest had a fairly bright appearance. The shop windows displayed more goods, although prices were higher. But it was a western or, should I say, European city which had come under Communist rule. People certainly didn't look happy. There was a fair amount of shabbiness about. The hand of death seemed to be on what once had been a gay place.

I had a fair dinner, with only fair wine, and went to bed early, since I had to get up at 6. The legation driver arrived with some money, I paid my bill of \$19 and we drove to the airport in the early morning light. We drove right up to the terminal because there are so few cars you can park at the main entrance.

P. S.—Mister Dremmin Got Those Magazines

In the last issue I gave prominent mention to Mr. Alexandre Dremmin of Intourist in Odessa, who wanted me to send him some American magazines. I had done so but had had no word as to whether he ever received them. I am pleased to report that since the last issue appeared, I have had a letter from Mr. Dremmin saying that he had, indeed, received the magazines and was pleased to get them. (An earlier letter from him never reached me.) He is busy these days guiding American tourists around Odessa and one of them, in fact, (Mr. Kolle of Lanseair travel agency in Washington), called the other day to pass on Mr. Dremmin's personal greetings.—W.W.P.

The driver for the legation was very helpful. He was a Romanian who spoke good English and always carried American cigarets with him to give out to airport personnel. After I checked in at the table set up by the door leading to the customs room, I got out the two remaining Havana cigars I had and gave them to the check-in chap (who wore no uniform and was dressed very sloppily), and to the trim customs chief. My bag was promptly marked "diplomatic" and I was treated as a hero.

About ten TAROM planes were brought out of the hangar one by one for the day's flights. They were all Li-2s. An Aeroflot Il-12 was parked on the far side of the ramp. In due course a CSA (Czech) American-built DC-3, shiny by contrast with the somewhat similar Russian-built planes, was pulled out. This was my plane for Budapest. My fellow-passengers included a Danish diplomat returning home and a strange mixture of peoples, better dressed than in Russia.

I felt as though I were making progress back toward the west. The DC-3 had both seat belt and no-smok-

ing signs in three languages including English. The seats were old but I believe they had been American built. The seat belt was the standard Air Associates belt—and worked. A good-looking Czech stewardess served breakfast on a tray from a familiar galley. I had two open-faced ham sandwiches, one cheese sandwich, an apple, a Romanian chocolate bar, a piece of rich pastry, and a cup of very strong, thick Turkish coffee. In addition there were three chocolates. I tried one and it was pretty awful.

But what a flight! A big high was over the whole area with no clouds in sight. First came the heavily-populated farming country, with the farms consisting of long, narrow strips and the homes hugging close to the roads. Then we reached the Carpathian mountains, some snow-covered, very attractive indeed. (I'm told they are usually obscured by overcast.) There was almost complete absence of motor vehicle traffic on the roads below and we passed one fairly good sized city with scarcely a single vehicle in sight.

We were at about 8,000 feet. The flying was good and smooth. Those American-built engines had a mighty good sound. Headwinds added 45 minutes to what was scheduled as a three-hour flight. And then we were landing at the airport on the east side of Budapest for a brand new experience in another Soviet satellite.

Budapest Terminal Impressive

Budapest has a handsome airport terminal. It was built before Communist domination, is spacious, and by all odds the best terminal I had seen since Stockholm. What was more, I had a reception committee to meet me. There was Colonel Weiwyn F. Dallam, Jr., the U.S. air attaché who had been advised of my coming, and there was Mrs. Lazlo, of MALEV, the Hungarian airline, who had had word of my impending arrival from SAS. (I was then back on the original schedule worked out in Washington many weeks earlier).

Customs is ordinarily quite difficult in Budapest but I was expedited although I had to give an accurate count of my money. (Some passengers were really sweating it out with customs men searching everything and everybody).

Having failed to see the Aeroflot people in Moscow, I was both surprised and pleased to be so well received by MALEV. Mrs. Lazlo said the commercial manager would like to see me so we set up a date for 3 p.m. Then Colonel Dallam drove me to the Grand Hotel on Margaret Island in the Danube between the two towns of Buda and Pest, where I checked in. This was once a deluxe hotel in beautiful surroundings but to say that it's deteriorated is putting it mildly. The rooms are dingy and the plumbing in bad condition but it is still about the best place to stay.

Colonel Dallam took me to his house for several excellent martinis and a fine lunch, then to the legation until the time came for my MALEV appointment. MALEV is cramped in an old building but seemed to be quite busy. It has a fleet of Li-2s and has an extensive local network plus international service to other satellites.

(To be concluded next issue)

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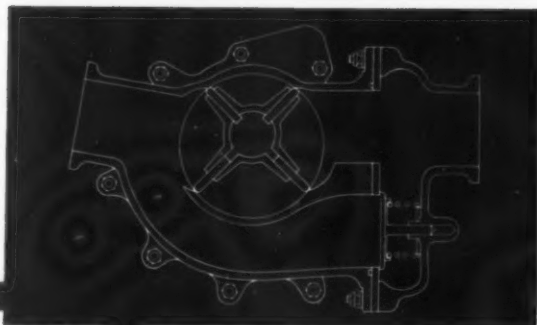
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